

CNC WEST

Volume 38 - Issue 4

THE MAGAZINE FOR WESTERN METAL WORKING MANUFACTURING

SOFTWARE AND CONTROLS

- **ROTTWEILER PERFORMANCE - A LOT OF BARK - JUST ENOUGH BITE WITH TRAK**
 - **CAM SOFTWARE AUTOMATES, MAXIMIZES 5-AXIS MACHINING PROCESS**
 - **FANUC ROBODRILL AND METHODS AUTOMATION INCREASE PRODUCTION**
 - **A BRIEF INTRODUCTION TO THE BASICS OF LIVE TOOLING**
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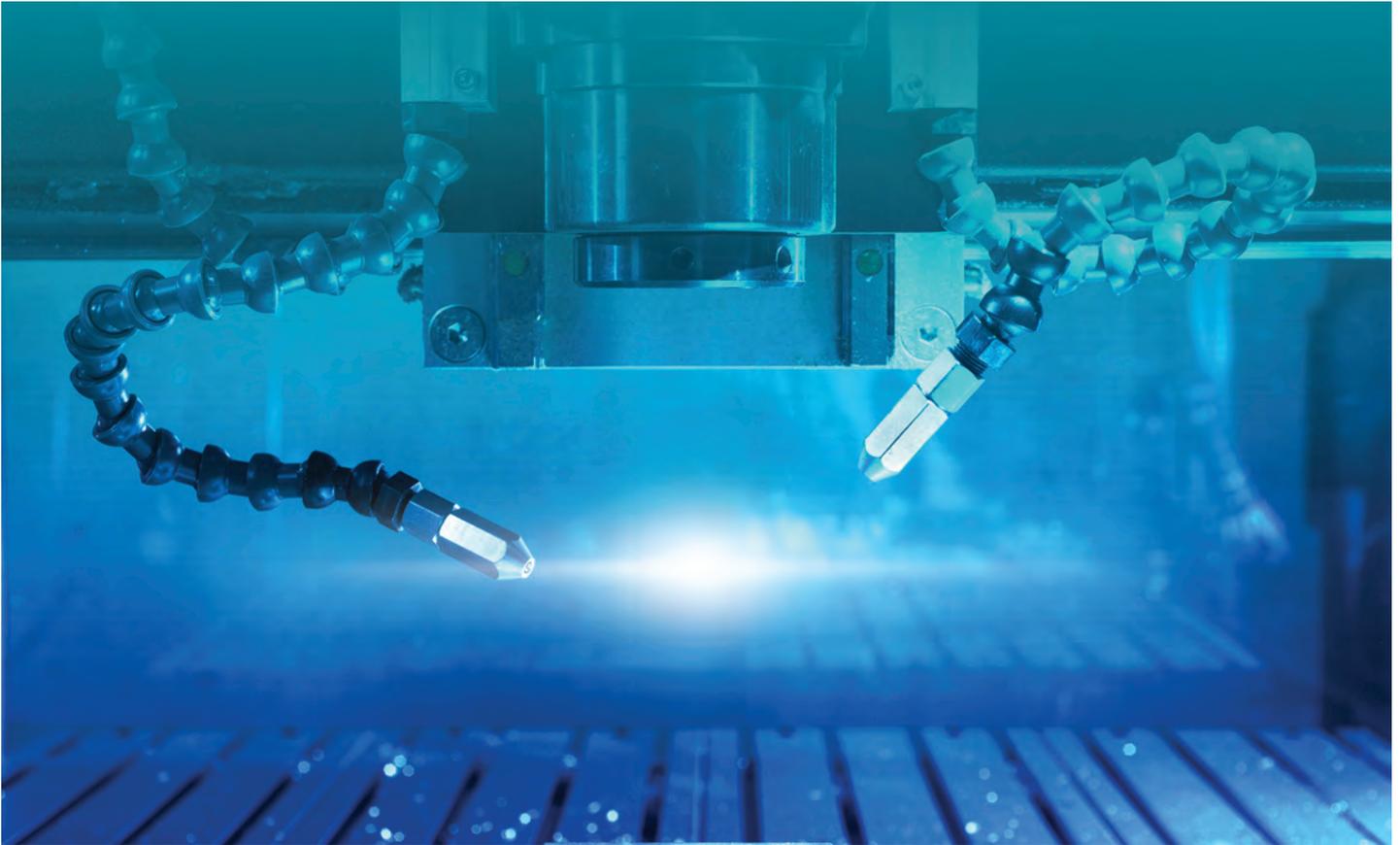
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CNC West

April/May 2020 • Volume XXXVIII No 4

Feature Stories

Fastems New Software Domain Can Plan, Control and Monitor
..... 20

A Lot of Bark and Just Enough Bite with Trak
*A shop that provides products to customize motorcycles
relies on Trak products.....* 22

CAM Software Automates ,Maximizes 5-Axis Machining Process
*CAM software helps Oregon company reach full potential
with 5-Axis machine.....* 34

A Brief Introduction to Live Tooling 42

High School Robotics Championship Held in Los Angeles
JPL receives volunteer of the year award at event 46

Arizona Company Trigger Happy with Methods and Fanuc Robodrill
Timney Triggers increases production with new machines..... 48

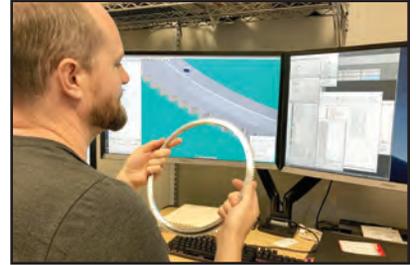
Covid19 Let's MAKE SOMETHING Out of This..... 50

Departments

4	Publisher Editorial	52	Industry News
8	Executive Hotline	62	New Products



*A big reason Rottweiler Precision uses a TRAK CNC lathe and mill is the ease of use control
.....See story on page 22*



*Tyler Bureau, Senior Manufacturing Engineer, Western Precision Products said the company purchased hyperMILL® to enable programming and running its 5-Axis machines to their full potential.
.....See story on page 36*



*Timney Triggers has been able to up their production and run overnight with the addition of new machines.
.....See story on page 48*

Coming in June/July 2020
Turning, Screw Machine and Medical Issue—This special issue features turning centers and screw machining. It highlights western shops that combine both machining and turning to streamline output.

*Editorial: May 22, 2020
Ad Space: May 25, 2020
Ad Material: June 5, 2020*



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The oldest regional industrial publication serving the Western States manufacturing managers, owners and engineers from 1 employee to those larger plants of 5,000 or more. Its editorials feature numerical control applications in all size machine shops, tooling, programming, robotics and shop operations, training personnel, financing of new equipment, cutting tools and all related manufacturing requirements. Coverage extends to all of Arizona, California, Oregon, Washington, Nevada, Utah, Idaho, Colorado, New Mexico and Texas.

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We Want to Help

DAMN! I don't even know where to begin. These are some crazy times and the first thing I hope for is that our readers are all physically OK.

My guess is that when you are reading this, your business is down a tad. Or maybe a lot. Or probably somewhere in between. This is unlike anything I have seen in this business which I have been a part of since 1979. Metal-working manufacturing is in my blood and I want to help. There is honestly not much I can do but with a great idea from editor Sean Buur CNC WEST has come up with something that might help.

For all you machine shops out there that might need a little publicity or perhaps even a boost of morale hopefully we have something for you. Send us a little about your shop such as when you started, what industries you serve, what machines you have and include up to 5 photos and we will make something up and either put in a print edition of CNC WEST or on our website. The cost you might ask? FREE!

Your shop and what they do will be seen by our 18,000 print readers or on our webpage that is frequented by thousands each month from all over the country. Or both. All you have to do is send it to sarnold@cnc-west.com and if it is a little rough around the edges, don't worry we can smooth it out for you. It will be our pleasure to try and give back a little to the community and industry that has supported us so strongly over the years.

This issue has some bite to it starting with the cover story. Rottweiler Precision makes custom parts for motorcycles and they revved up their business with the addition of a couple of machines from Southwestern Industries. They got a CNC lathe and a CNC mill with Trak controls and are leaving their competitors in the dust.

There are a couple of Covid19 articles in this issue. One is from Master Fluid Solutions with tips on keeping your machines and machine fluids clean. As we all know by now cleanliness is a major factor of fighting the virus. The other is from Michael Larsen of Hainbuch Corporation who believes that the current disruption in manufacturing will require companies to undergo a major adjustment of their views on all aspects of the process. The result in the long run will be a more effective and efficient system.

There is an article about an Oregon shop that realized that implementing 5-Axis machining can be an excellent strategy for efficiently producing accurate, complex parts. In addition to the right machine, tooling and fixture options, CAM software should be carefully selected and the article is about the software they chose.

A Brief Introduction to Live Tooling is actually a little more than brief. It is a nice read about live tooling that I think you will enjoy and learn from. We also have an article about an Arizona company that utilizes products from Methods Machine Tools to increase production. There are more articles along with our normal industry news and new product sections. Also there are plenty of advertisements from companies that want to help your shop in the west. I hope you recognize that these companies are the ones that insure you get a free issue of CNC WEST every other month.

Thanks for reading and be safe out there,

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CNC WEST April/May 2020

Shawn Arnold

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EXEC HOTLINE

BAE in San Diego Awarded \$49.6 M to Support Air Vehicle Planning System

BAE Systems was awarded a \$49.6 million contract modification to support the Air Vehicle Planning System for the U.S. Air Force, according to the Pentagon.

According to the Department of Defense, the total cumulative value of the contract is \$195 million.

No funds are obligated at the time of the award; fiscal 2019 and 2020 funds earmarked for research, development, testing and evaluation as well as operations and maintenance will be applied.

The Air Vehicle Planning System, is a force-level mission planning system that performs routing and analytical functions in support of the Air Force's operational plan and cruise missile planning.

Work on the contract will be performed at Offutt Air Force Base in Nebraska and in San Diego, Calif., with an expected completion date of Jan. 31, 2024.

Raytheon Awarded \$90.4M for JMEWS Warheads for Tomahawk Missiles

Raytheon Missile Systems has received a \$90.4 million contract to provide engineering and manufacturing development for the Navy's Joint Multiple Effects Warhead System, the Pentagon announced.

The JMEWS program is the new warhead for the Tomahawk Block IV tactical cruise missile.

According to Raytheon, the JMEWS program is designed to give the Tomahawk Land-Attack Missile enhanced penetration capabilities, while retaining its blast-fragmentation capabilities.

The first JMEWS weapons completed testing in 2010.

This contract funds the design, integration, test and evaluation for the program, 79 percent of which will take place at Raytheon's Tucson, Ariz., worksite.

Pentagon Announces \$2.4B Sale of 8 Boeing KC-46 Aircraft to Israel

The Pentagon announced in early March that the U.S. State Department has approved the potential sale of up to eight Boeing KC-46 aerial refueling tankers and associated equipment to Israel for \$2.4 billion.

Israel would become the second international customer for the Boeing tanker.

The U.S. Air Force accepted the aircraft in January of last year, but identified problems with the faulty cargo locks, which were fixed.

Along with eight KC-46 tanker aircraft, Israel has requested to buy up to 17 turbo-fan engines, including one spare, and up to 18 navigation systems, including two spares.

Among other associated costs included in the \$2.4 billion sale are radios, transponders, spare and repair parts, maintenance, training equipment, personnel services, flight test and certification and other logistical support.

The DSCA notified Congress of the potential sale. Congress has the ability to block foreign military sales, but that is unlikely to happen in this case since Israel is a close ally.

Boeing Awarded \$800M to Support P-8As for U.S., South Korea, New Zealand

Boeing received an \$800 million contract modification in support of lot 11 P-8A aircraft for the Navy, the Department of Defense announced.

The P-8A is a multi-mission maritime patrol aircraft used for anti-submarine warfare and anti-surface warfare as well as intelligence, surveillance and reconnaissance and search and rescue. More than 97 percent of the work on the contract will be performed in Seattle, Wash., with some work being performed in Huntington Beach, Calif., Mesa, Ariz., and El Segundo, Calif.

Continued on page 82.....

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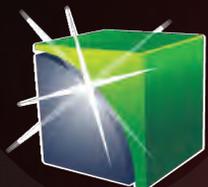
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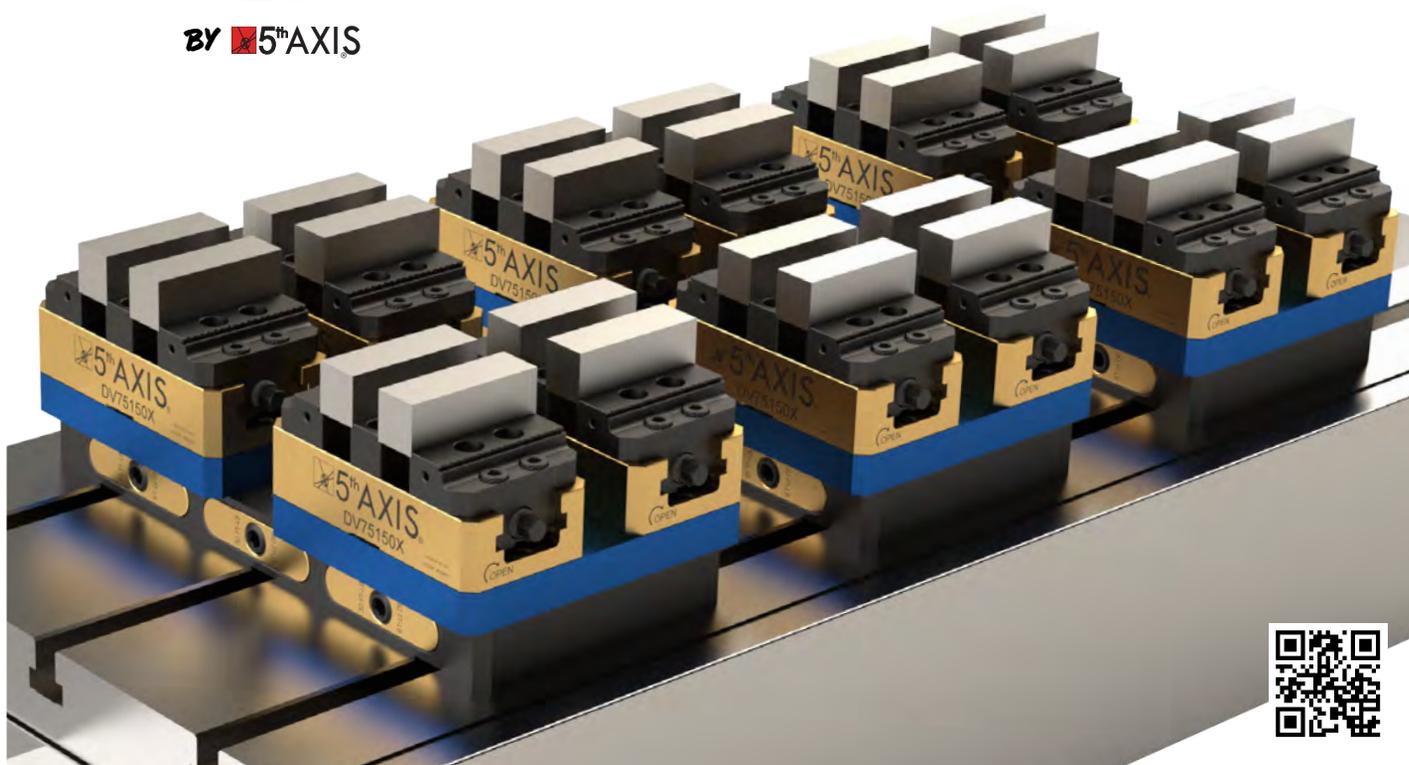
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					3	TG-8300F	\$ 64.44	10"	10-RTG-8300A	\$ 240.33
10"	.501	.749	1/2	2.125	2	TG-10200F	\$ 23.83	12"	12-RTG-10200A	\$ 184.94
					4	TG-10400F	\$ 75.33	15"	15-RTG-10400A	\$ 607.05
12"	.501	.749	1/2	2.500	2.5	TG-12250F	\$ 72.22	15"	15-RTG-12250A	\$ 494.11
					4	TG-12400F	\$ 102.35	18"	18-RTG-12400A	\$ 851.69
15"	.501	.749	5/8	3.000	2.5	TG-15250F	\$ 87.22	21"	21-RTG-15250A	\$ 908.09
					4	TG-15400F	\$ 113.74	24"	24-RTG-15400A	\$ 1,550.55

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						Part Number	Set Price
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					3	RKT-6300A	\$ 104.86
					4	RKT-6400A	\$ 118.88
Kit B208 N208 HS-08	8"	0.551	12MM	0.984	2	RKT-8200A	\$ 85.36
					3	RKT-8300A	\$ 134.30
					4	RKT-8400A	\$ 159.83
Kit B210 HS-10	10"	0.630	12MM	1.181	2	RKT-10200A	\$ 126.28
					4	RKT-10400A	\$ 193.60
Kit B12 HS-12	12"	0.709	14MM	1.181	2	RKT-12200A	\$ 184.71
					3	RKT-12300A	\$ 245.72
Kit B212 BBM 315	12"	0.827	16MM	1.181	2	RKT-12208A	\$ 184.71
					3	RKT-12308A	\$ 278.56

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						Part Number	Set Price	Part Number	Set Price
Kit B206 HO27M6 HS-06	6"	0.472	10MM	0.787	2	KT-6200F	\$ 34.37	KT-6200AF	\$ 31.59
					3	KT-6300F	\$ 44.99	KT-6300AF	\$ 41.12
					4	KT-6400F	\$ 95.71	KT-6400AF	\$ 86.08
Kit B208 ZA6-8 HS-08	8"	0.551	12MM	0.984	2	KT-8200F	\$ 40.70	KT-8200AF	\$ 38.56
					3	KT-8300F	\$ 46.82	KT-8300AF	\$ 50.90
					4	KT-8400F	\$ 61.00	KT-8400AF	\$ 62.11
Kit B210 HS-10	10"	0.630	12MM	1.181	2	KT-10200F	\$ 45.84	KT-10200AF	\$ 46.66
					4	KT-10400F	\$ 76.14	KT-10400AF	\$ 67.46
Kit B12 HS-12	12"	0.709	14MM	1.181	2	KT-12200F	\$ 72.00	KT-12200AF	\$ 74.05
					3	KT-12300F	\$ 107.96	KT-12300AF	\$ 90.10
Kit B212 BBM315	12"	0.827	16MM	1.181	2	KT-12208F	\$ 72.00	KT-12208AF	\$ 74.05
					3	KT-12308F	\$ 107.96	KT-12308AF	\$ 90.10

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B-208, HS08	8"	KT-80HJ2	\$420.66
B-210, HS10	10"	KT-100HJ2	\$500.80
B-12, HCH12	12"	KT-120HJ2	\$540.84
B-212, HS12	12"	KT-128HJ2	\$540.84

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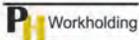
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- Internal threads for use with threaded collet stops
- Large variety of round, hex and square sizes
- EMERGENCY COLLETS also available in 5C, 3J & 16C

16C & 3J ROUND Collets
\$59.00 ea

16C & 3J SQUARE Collets
\$74.00 ea

16C & 3J HEX Collets
\$69.00 ea



HARD JAWS

For 1.5mm x 60° Serrations Chucks



- Designed for first operation roughing, expect runout between 0.005-0.010
- Reversible- for OD & ID workholding
- 2 steps (1 step hard jaws also available)
- Ground body for improved run-out
- OEM STYLE features ground tips
- XTRA BITE: Very aggressive bite with conical teeth for extra gripping
- For Kitagawa™, Samchully™ & other chucks

Chuck Model	Chuck Dia	GRIP-RITE OEM STYLE		XTRA BITE	
		Part Number	Price Per Set	Part Number	Price Per Set
B206, HS06	6"	KT-60HJ2-U	\$245.75	KT-60HJ2-X	\$256.55
B208, HS08	8"	KT-80HJ2-U	\$294.53	KT-80HJ2-X	\$312.71
B210, HS10	10"	KT-100HJ2-U	\$336.60	KT-100HJ2-X	\$370.44
B-12	12"	KT-120HJ2-U	\$391.99	KT-120HJ2-X	\$415.42
B-212, HS12	12"	KT-128HJ2-U	\$390.92	KT-128HJ2-X	\$416.29
B-15	15"	KT-150HJ2-U	\$504.90	KT-150HJ2-X	\$554.85

RETENTION KNOBS

Your VALUABLE Machine Deserves A Premium Knob!



- Individually Magnetic Particle Tested
- Made in the USA!
- Large Variety of CAT & BT Tapers
- Made of 8620, Heat Treated to Rc 56/58
- Exceeds Industry Standards For Tolerance (ANSI, DIN, JMTBA)

Machine	Thread	Head Dia	Angle	Coolant	Part Number	Price EA
Fadal BT40	M16-2.0	.740	90°	No	B40-4501S	\$ 17.72
HAAS BT40	M16-2.0	.590	45°	Yes	B40-4500H	\$ 22.80
HAAS CAT40	5/8-11	.589	45°	No	C40-4501S	\$ 17.72
Fadal CAT40	5/8-11	.740	45°	No	C40-4500S	\$ 15.20
Okuma CAT40	5/8-11	.589	60°	No	C40-6000S	\$ 17.72
Mazak CAT40	5/8-11	.740	45°	Yes	C40-4500H	\$ 15.75
Mori Seiki CAT50	1-8	.905	90°	No	C50-9000S	\$ 21.85



ER COLLETS



- PRECISION ER Collets:
- 0.0005" TIR or better
 - TRUE INCH & metric sizes
 - Crafted from high quality spring steel
 - Individually tested for accuracy
 - TG, DA & AF collets also available
 - 100% Satisfaction Guarantee!



SAVE BIG ON COLLET SETS!

ER 11/ER 16
Prices Starting At:
\$8.75 each
OLD Price: \$16.50

ER 20/ER 25
Prices Starting At:
\$9.75 each
OLD Price: \$18.00

ER 32
Prices Starting At:
\$10.25 each
OLD Price: \$18.00

ULTRA PRECISION (0.0002" TIR) COLLETS ALSO AVAILABLE!

CAT-40 BALANCED TOOLHOLDERS

KINGSTON: Balanced to 15,000 RPM @ g6.3
SPIN TRU: Balanced to 20,000 RPM @ g2.5

- Balanced on a HAIMER machine
- Includes certificate of balancing
- Runout 0.0002" TIR or better
- Manufactured to ISO 9002 quality control standards
- Traverse ground taper to AT3 specs
- H5 bore tolerance
- Collet chucks, Shell mill, Jacobs/ Morse Taper holders available



Dia	Proj	BALANCED TO 15,000 RPM		BALANCED TO 20,000 RPM	
		KINGSTON Part Number	Price Each	SPIN TRU Part Number	Price Each
1/8"	1.75"	C40-01EM175-K	\$ 49.95	C40-01EM175-KB	\$ 69.99
3/16"	1.38"	C40-18EM138-K	\$ 49.95	C40-18EM138-KB	\$ 69.99
1/4"	1.38"	C40-25EM138-K	\$ 49.95	C40-25EM138-KB	\$ 69.99
	1.75"	C40-25EM175-K	\$ 53.85	C40-25EM175-KB	\$ 69.99
5/16"	1.38"	C40-31EM138-K	\$ 53.85	C40-31EM138-KB	\$ 69.99
	1.38"	C40-37EM138-K	\$ 49.95	C40-37EM138-KB	\$ 69.99
3/8"	2.50"	C40-37EM250-K	\$ 53.85	C40-37EM250-KB	\$ 69.99
	1.75"	C40-50EM175-K	\$ 53.85	C40-50EM175-KB	\$ 69.99
1/2"	4.00"	C40-50EM400-K	\$ 53.85	C40-50EM400-KB	\$ 69.46
	1.75"	C40-62EM175-K	\$ 53.85	C40-62EM175-KB	\$ 69.99
3/4"	3.00"	C40-62EM300-K	\$ 53.85	C40-62EM400-KB	\$ 73.02
	1.75"	C40-75EM175-K	\$ 53.85	C40-75EM175-KB	\$ 69.99
1"	3.00"	C40-75EM300-K	\$ 53.85	C40-75EM300-KB	\$ 69.99
	1.75"	C40-10EM175-K	\$ 53.85	C40-10EM175-KB	\$ 69.99
1-1/4"	6.00"	C40-10EM600-K	\$ 60.45	C40-10EM600-KB	\$ 74.47
	2.00"	C40-12EM200-K	\$ 53.85	C40-12EM200-KB	\$ 69.99



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BMC-135R In Stock!

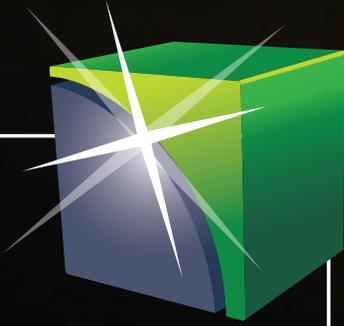
- Spindle Speed 1,500 RPM (CT-50 Taper – 30/35 HP)
- Through Spindle Coolant • 60 Tool ATC
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Fastems New Software Domain Can Plan, Control and Monitor

Even Non-Automated Equipment – Standing Alone or in a Cell



Fastems Manufacturing Management Software (MMS) has proven to be a powerful solution for planning, forecasting, controlling, visualizing, and monitoring automated manufacturing processes. The new MMS Domain, Work Cell Operations (WCO), now makes it possible to include all manual production tasks, work cells, and stand-alone machines in the IT-supported planning, control and monitoring of production. For this purpose, the solution can be used either separately for machines or manual workstations or in combination with an automated pallet and/or workpiece handling system.

“MMS Work Cell Operations, or WCO, brings the unique Fastems features like automatic, predictive scheduling and full transparency of manufacturing operations, for stand-alone machine tools and other manually operated workstations,” said Tomi Kankainen, CDO and VP of Fastems MOM Software business.

WCO promises a whole range of advantages for work preparation, shop floor and controlling, including time-optimized, automated production planning that takes the entire process chain, managed by WCO, into account, along with automatic detailed planning that allows production with smaller part buffers, among other parameters. According to Fastems, in particular, employees on the shop floor have a clear view of what tools and materials are needed and which resources may be missing. Additionally, employees always know exactly which tasks are due in a shift as they are provided with clear, prioritized work lists. These

various triggers improve the timeliness of resource ordering and transfer logistics so that tools and materials are always delivered on time to the machines, cells, or FMSs. If permitted, the employee at a machine or work cell also has access to all important production documents and instructions via the WCO module. Against this background, WCO also offers greater transparency with regard to current information on manufacturing capacities, production output, and order status.

These few examples illustrate the enormous potential of WCO, which has a direct positive influence

on the key parameters for highly efficient overall production, including higher utilization of production capacities, increased production output, shorter lead times, higher delivery reliability (e.g., through automatic planning based on real production orders, due dates and quantities) and less WIP (Work-in-Progress). The result of detailed planning and seamless transfer of information will translate to higher production quality.

The company reports that another compelling aspect of the Fastems new WCO software is that it provides all the powerful tools needed to combine automated and non-automated production steps in a uniform production management system. Functions such as deburring and parts washing can now be incorporated into cells and monitored right along with CNC machine tools and the automation equipment integrated into the cell or FMS.

The solution is therefore a decisive step towards full integrated manufacturing management often referred to as MOM (Manufacturing Operations Management), enabling continuous improvement of all production processes through the digitalization of manufacturing workflows.

As with all of Fastems products and services, WCO is offered at several levels of engagement and application for the comfort and practicality of a customer’s operations and goals. Fastems automation equipment and software can be installed in phases, with each stage growing in capability and functionality.

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ROTTWEILER PERFORMANCE



Article & Photos by Sean Buur

A LOT OF BARK & JUST ENOUGH BITE WITH TRAK



Chris Parker, owner and founder of Rottweiler Performance.

Chris Parker, owner and founder of Rottweiler Performance has leveraged his experience as a world class fabricator into a worldwide brand. Those who live life on two wheels know Rottweiler Performance, appreciate the quality, and understand that sometimes you just gotta let the big dog eat. Chris describes Rottweiler Performance as a design and manufacturing facility with the primary goal of creating useful products to customize motorcycles.

Chris began fabricating in the early 90's when he was given a shot at welding by a local Orange County, CA. fab shop. He had a knack that earned him jobs throughout the southland. He hit the big time when he got a job as a fabricator at Rod Millen Motorsports. It was a baptism by fire and a crash course in brain surgery all in one. "Rod Millen Motorsports at the time was one of the top off road/rally racing teams in the world," tells Chris. "Here I was a young welder/fabricator being part of the world record breaking Pike's Peak hill climb team. I knew then that I wanted motorsports to be a permanent part of my



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Chris Parker is a self-taught machinist. He realized early in his career how valuable the use of machine tools can be to fabricators. The TRAK DPM RX7 mill paired with the ProtoTRAK control gives him the ability to machine the parts he needs with the ease of use that comes with conversational programming. His big takeaway is the TRAK tool room machines make part time machining possible for companies like Rottweiler Performance.



The TRAK TRL 1630RX lathe is the first CNC turning center Chris has owned and ran. Their programming experience on the lathe is way less than on the mill so they really take their time. Fortunately, one of the many great things about the TRAK machines is called TRAKING. It has hand cranks like a manual machine that allows for programming it with the cranks at your own speed.

life.” Racing has taken Chris from the top of the Rockies to the beaches of Baja as a racer, driver, tuner, fabricator and team owner. The day CNC West was on site interviewing him Chris was busy prepping the team for the upcoming Sonora Rally, a 5-day long endurance event that they had entered on an adventure bike.

CPR (Chris Parker Racing) came about around the turn of the century. The focus was on products like high-end exhaust and intake systems for race cars, pedal systems and anything that needed an expertise that only a fellow racer could understand. “I had talent as a welder” explains Chris. “But a fabricator is a good welder who can solve puzzles. Racing brings with it nothing but puzzles to be solved. By word of mouth I began to gather a fol-

lowing. All my customers came from referrals and I was able to blend fabrication in with machining to solve my customer’s particular puzzles. I had the luck to get the jobs, but the skill to keep them. I started with a small 1300 sq. ft. shop just around the corner from where we are now in Costa Mesa. We were racing everywhere, prepping cars and trucks for races like the Baja 1000. Baja is where I met my wife Mariel; she is up front and runs the day to day operations of the company.” In the early part of their relationship Chris traveled to Mexico at every chance he got to see her. The best mode of transportation to do that is on a motorcycle because it’s just plain more fun and the border waits were greatly reduced because of your ability to get to the front of the line. He rode a KTM street bike at the time and swore he was going to keep it stock. “Stock was an unrealistic goal,” laughs Chris. “I started to mod it out like everyone does. Making something uniquely your own is part of what makes motorcycles so great.” He took a perfectly good KTM orange bike and blacked it out. “I designed and built a custom intake for it like nothing else on the market,” touts Chris. “It is an open intake system that utilized a certain kind of filter that I had sourced custom made for me. I made alterations and it made a ton of horsepower. KTM can make a perfect bike, it is called a Moto GP or factory rally bike, but due to restrictions, homologations, and cost the intake on consumer bikes was an area that was ripe for improvements.” You can bolt on one of our intakes with no other modifications and instantly feel the difference. Fuel mapping and exhaust customization yields even greater results. “Word got out



Chris recently added a new CNC press brake to the shop as yet another upgrade.

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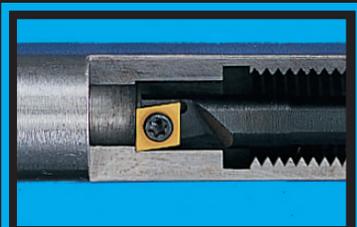
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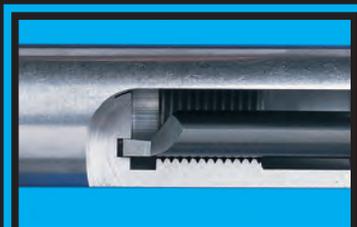
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that I had this intake and soon I was making them on the weekends for beer money," laughs Chris. "Then it became lunch money, then dinner money, then rent money. We started dyno tuning bikes, that eventually morphed into the company we have now." The problem Chris had was with the name CPR (Chris Parker Racing). Though clever and worked great with intake and exhaust it just wasn't catchy like some of the others in the industry. One day pondering what to rename it he revved the bike and a guttural bark came out of it like a large dog. He gazed at this all black motorcycle that looked and sounded like a dog. If it was a dog what kind would it be? With an aggressive stance and a throaty bark, Rottweiler Intakes was born.

The great thing about having a product vs hourly manual labor is the ability to create income while you are away from the shop. You can't get the bills paid while you are sleeping or on vacation, but you can if everything is in place to sell and distribute while you are working on the next big thing. Rottweiler Performance started with a single intake but growing the brand with more and more products was the direction Chris and Mariel took. "Building a brand and building a product was a big transition for us," explains Chris. "It's literally been a nine-year journey just getting to where we're at today. Nine years in and the business has nearly doubled every year." Their current manufacturing, distribution, and tuning facility is 6000 sq.ft. and houses a state-of-the-art dyno system, CNC mill, CNC lathe, all the fabrication and welding gear one could need and a CNC press brake.

At Rod Millen Motorsports Chris learned machining techniques out of necessity, but he recognized that to be

a great fabricator you needed to augment what you are doing with higher end tools. When he set out on his own one of the first machines he bought was a TRAK CNC mill. "I'd used an older TRAK mill before working for a race shop, so when it came time to buy something, I went with what I already knew," tells Chris. "That first machine I used was super primitive even for back then. It was just a digital read out and no pictures, you would program it and hope that it went left and right or straight or whatever you hoped that you told it to do it. I'm not a CNC machinist, but I've taught myself how to machine. To double check programs I would load it with a clipboard and a sharpie pen and draw things out for confirmation. When it came time to spend my own money, I purchased a similar system, but one that did have the ability to show me previews without needing pen and paper." After moving into their new shop Chris was at a point with the business that it was finally time to upgrade their machining capabilities and bring more of the manufacturing in house.

Southwestern Industries' Pat Fitzsimmons, or TRAKing Pat as he is known has been trying for a decade to get Rottweiler Performance into a new TRAK machine. TRAKing Pat is one of the few salespeople even allowed in the shop. "We have a sign on the door that says no soliciting we're only nice about this once and the sign is the first time," jokes Chris. "That doesn't apply to Pat. The thing about TRAKing Pat is that he never hard sold us on anything. He knew we loved our older machine and that eventually we would be in a position to get a new one." For the longest time Rottweiler Performance was just not able to bridge the gap needed to step up into current technology. It was more of a want than a need. "It got to the point where I was able to sack away enough money and called him up and said it's time for a new machine," tells Chris. "Then I surprised him with also wanting a lathe. In my mind there was no point upgrading one without the other. We didn't use our manual lathe for production runs so by adding the TRAK TRL 1630RX lathe with RLC controls I could actually do our own turned parts. Sales and service are amazing on both machines. They did us a huge solid changing out the mill I originally ordered to the newer TRAK DPM RX7 with more features and the RMX control. The TRAK DPM RX7 became available right when my original machine was being delivered. I can't say enough about how awesome they were about getting us in the newest machine delivered and setup. I paid the difference in the cost of the machines and that was it. It says a lot about Southwestern Industries as a company to not even charge me again for shipping."

Milling and turning is handled by James and Chris, two self-taught machinists. TRAK's conversational programming is a key element



in maximizing workflow at Rottweiler Performance. Rottweiler Performance doesn't manufacture parts every day so having the user-friendly TRAK controls makes life way easier for Chris and James. "TRAK's touch screen conversational programming is jam packed with features that make programming less stressful for people who may not be full time machinists," details Chris. "Lots of companies have owners, programmers, setup guys and button pushers. That hierarchy doesn't work for us. We need to run our own parts, when we need them, in the easiest and most productive way possible. Southwestern Industries came in and trained us on both machines and are still supporting us with any questions we have. It always takes a bit of time to recall how to run the machines, but TRAK's conversational control minimizes the time it takes for us to remember. For us, the new controls are a big step up in technology. The language on the Trak DPM RX7 mill added an automated 3rd axis. Before we were two dimensional and I had to control Z axis. Having the additional third dimension was kind of like going from riding a bicycle to riding a motorcycle. You already feel pretty familiar, but now OK, there's a couple new things I gotta figure out here." The controls are designed to be as intuitive as possible. Chris used to have to trick his old machine into doing certain things. Some of that might have been him going at it in an unconventional way, but he doesn't need to lie to the machine any more by cheating on tool size. The latest TRAK controls now have a plus +/- built in for that. "Bulk edit is another feature we have used more than we thought we would, add Chris. "You can make an edit on something like speed in real time via the virtual dial on the control and then tell it to increase throughout the entire program. It is a really handy feature."

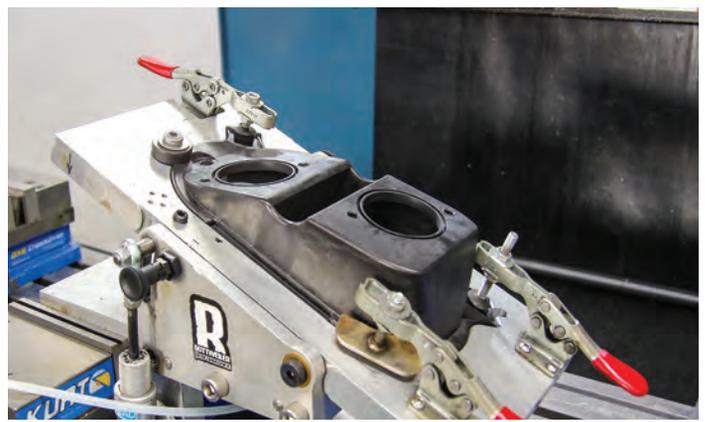


Top - One of many house branded items that Rottweiler Performance was able to bring in house for manufacturing after getting the TRAK DPM RX7 milling center.

Below - Quick Flip Mirror Mounts give the rider the unique ability to choose from any 7/8 handlebar mirror and mount them to the handguards.



The TRAK milling and turning stations sit in their own area of the shop away from the sightline of walk in customers. One of many computer terminals sits between the two machines allowing complete network access. Everything from setup sheets to order information is paperless on the Rottweiler network.



The TRAK DPM RX7 mill has a large 24"x60" table allowing for plenty of fixturing space. The current setup is for Rottweiler Performance intakes. Chris created a rocking table system allowing him the ability to machine multiple surfaces without removing and remounting the part unnecessarily.

The Track TRL 1630RX lathe is Rottweiler Performance's first CNC lathe and Chris admits that it is a bit scarier to run for them compared to the mill because a spinning chuck carries a lot more momentum than a tiny end mill. "Like on the mill, ease of use to get us running as fast as possible is important," comments Chris. "Our programming experience on the lathe is way less than on the mill so we really take our time. Fortunately, one of the many great things about the TRAK machines is called TRAKing. It has hand cranks like a manual machine that allows for running through the program with the hand cranks at your own speed. You can choose CNC run, or run it via TRAKing by turning the wheels. It goes through the entire code at your pace, forwards and backwards. Some things like tool changes and tapping go in real time, but for the most part it is turn the crank and watch how it goes at your own comfort level. The touch screen controls also allow for on the fly edits and adjustments. We program on the conservative side to start but can easily make an edit and ramp things up right from the controls. These features aid in the comfort level of running the machine for non full-time machinists. Our big takeaway is the TRAK tool room machines make part time machining and one off's possible."

Rottweiler Performance design and manufacture a few dozen of their own branded parts on site. "Mirror mounts, blocking plates, and filter bases are a few of our biggest sellers that we now manufacturer in house," tells

Chris. Once we got our new Trak machines, we pulled more and more parts back in house. Our frustrations were wait times and price. As an example, we sell these small little plates that block off an area that is no longer being used with our intakes. We were being charged a completely reasonable price of 2 bucks each and ordering 2000 at a time. I'd write a check for 4 thousand dollars and it hurt. It isn't a complex part, but we sell a lot of them. Our new TRAK DPM RX7 has a 24"x60" table. We made this super long fixture to maximize all the available travel. When all was said and done it saved us a lot of money and I can now run in batches as needed without having to order and store huge quantities. We see that savings across the board on most of our items that we can now machine. It isn't always half the cost of sending it out, but 90% of the time there is enough of a savings to make it worth doing."

Loving what you do drives Chris and his squad. "Culture is a big part of how we do things at Rottweiler Performance," concludes Chris. "We have a group of 10 enthusiasts that make up our team. We work together, play together and all love what we are doing. That makes a big difference. We want to maximize the dopamine hit of coming to work here and enjoying it. We value our employees and customers over all else. We just hit our second booster rocket. We are either going to space or going to parachute back down to earth. All signs are pointing to us blasting higher and higher."

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Bar Feeder Interface

Door Interlock

Tool Setter

Parts Catcher

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Tips for Keeping Your Machines Clean

Supplied by Master Fluid Solutions

As the COVID-19 crisis continues to disrupt the way companies operate, there are many concerns about workplace cleanliness and the health and safety of workers when dealing with the novel COVID-19 virus.

Master Fluid Solutions wanted to share some useful guidelines about how manufacturers can manage machine cleaning and maintenance in a COVID-19 environment. This information is based on the CDC's guidelines for minimizing the spread of the virus and OSHA/HHS guidelines for implementing updated cleaning and safety measures and workplace controls.

While our products endure vigorous health and safety testing during the formulation phase to reduce the GHS and SDS impact as much as possible, this virus is so new that no testing or information concerning its sustainability in a metalworking fluid matrix is currently available. Until we have more information and a clear guidance from the CDC, we suggest following the guidance below for handling potentially contaminated metalworking fluids and in-process cleaners:

- If any metalworking fluids and in-process cleaners are suspected of being contaminated with COVID-19, they should be removed from the machine using proper Personnel Protective Equipment (PPE) and disposed of under local municipality waste treatment guidelines.
- The machine should be cleaned with Master STAGES™ Whamex™ or Whamex XT™ in accordance with Master Fluid Solutions Quick Clean Procedures to have minimal effect on your operations. You can find these cleaning procedures on pages 9 through 12 of “The Handy Pocket Guide to a Clean Shop”.
- Master Fluid Solutions does not recommend adding disinfectants or bleach to the metalworking fluid system. Doing so can increase the chance of other issues such as dermatitis, machine and part corrosion, chemical reactions and odor concerns.

Preparing Your Sump for a Temporary Shutdown

In the event of a potential shutdown, there are several steps that companies need to take to maintain their sump. The steps below will help prepare your sump for a temporary shutdown, and should be started several days prior to any shutdown.

Before starting, it is critical that the systems be in as good of a shape as possible when they are shut down. Concentration, pH, reserve alkalinity, etc. should be in the specified range.

1. Remove the tramp oil from the sump. Tramp oil is both food and shelter for bacteria, which is the main cause of the rancid smell that can come from the coolant.
2. Clean out chips and sludge from the sump. Chips and sludge are also food and shelter for bacteria. A Sump Sucker will make this job quick and easy.
3. Bump up the concentration – this adds a little more pH buffering to the sump, which helps to prevent bacteria. Our recommendation is to bump up the concentration to the maximum recommended operating range for the product being used. If adds are needed for alkalinity, pH, etc., add them a day or so before the system is shut down.
4. Make arrangements for whatever sampling you want to have done to be completed and the results communicated before the shutdown occurs.
5. If possible, recirculate the coolant in the sump during the shutdown. In many cases maintenance staff may be present. Have them turn on the coolant pumps to recirculate the volume of the sump several times over.
6. If you are going to run a centrifuge over the shutdown make sure you have sufficient tramp oil and waste capacity.
7. Finally, make sure you have plenty of supply of Coolant, Whamex XT, Task 2 etc. to keep the systems running smoothly and to prevent any issues for when life gets back to normal.

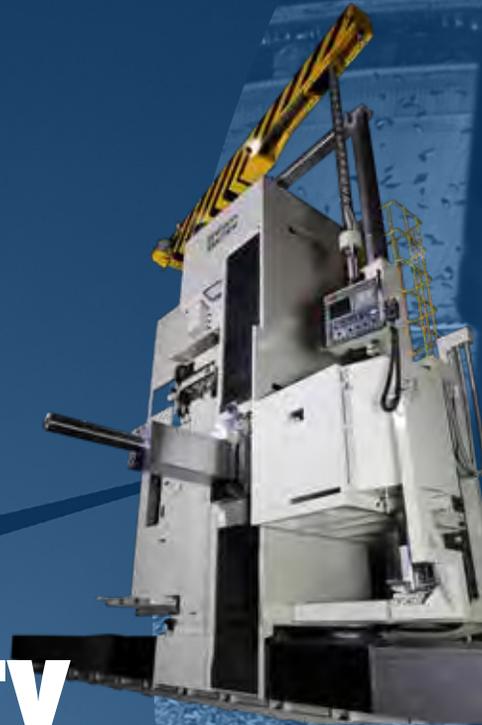
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BSF-150C

Floor-Type Horizontal Boring Machine

Spindle	φ5.9" CAT-50 / 3000rpm [AC50/40HP]
Ram size	14.96" x 14.96"
X Travel	177.2" ~ 708.7"
Y Travel	98.4" ~ 157.5"
Z Travel	29.5" (OP 35.4")
W Travel	29.5" (OP 35.4")
Z+W Total	59.1" (OP70.9")
Feedrate	(X,Y,Z,W) 0.04 ~ 236 ipm



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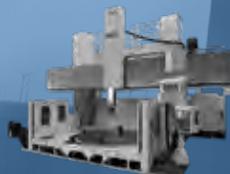
BP-150.R22, (OP:R35)

Table-Type Horizontal Boring Machine

Spindle	φ5.9" CAT-50 / 2500rpm [AC50/40HP]
X Travel	160" (OP 240")
Y Travel	120" (OP 140")
Z Travel	60" (OP 88")
W Travel	28" (OP 35")
Table size	70.8" x 86.6" (OP 78.7" x 137.8")
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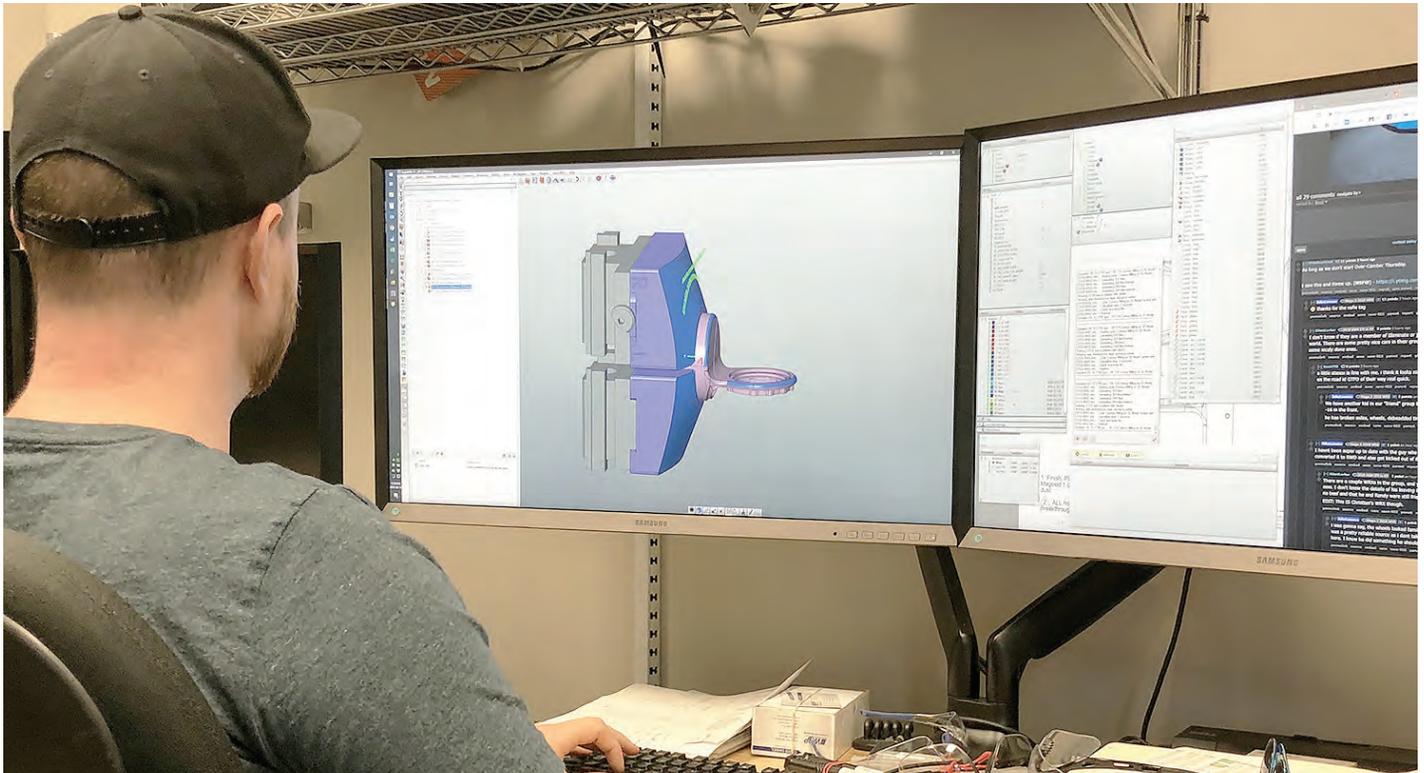
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CAM SOFTWARE AUTOMATES, MAXIMIZES 5-AXIS MACHINING PROCESS

Article Supplied by *OPEN MIND Technologies Images Courtesy of Western Precision Products, Inc.*



hyperMILL® CAM software suite enables powerful 5-Axis strategies for machining challenging geometries, free-form surfaces and deep cavities.

Implementing 5-Axis machining can be an excellent strategy for efficiently producing accurate, complex parts. However, it takes more than the right machine tool to realize the full potential of a 5-Axis process. In addition to the right machine, tooling and fixture options, CAM software should be carefully selected.

When Western Precision Products, Inc. (Tualatin, OR) made the decision to reinvent some machining processes by incorporating 5-Axis machining, they started planning and carefully considering the “big picture” over a six-month period. During this time, they concluded that only the leading solutions would suffice for its 5-Axis setup.

Western Precision Products (WPP) has been a precision machining manufacturer for over 30 years. WPP and its 85 employees handle projects from prototype through production in a high-tech, 48,000 sq. ft. production facility in the Portland, Oregon metro area. Aerospace and electronics make up the majority of WPP’s industries served, in addition to hydraulics, power supply

equipment, recreational equipment, semiconductor processing, and testing and measurement equipment.

WPP deploys a variety of machining technology including lathes, mill-turn and Swiss machines as well as horizontal milling and vertical milling centers. The type of parts manufactured spans a wide range from small intricate components to large structural parts. An AS9100 Rev D certified company, WPP’s jobs include manufacturing structural and complex parts for the aerospace industry which often have tight part tolerances and short lead times. Also, aerospace materials range in the thousands of dollars per part, making the risk of mistakes very costly. It is essential to make parts right the first time.

5-AXIS STRATEGY

During the planning period for adopting 5-Axis technology, WPP wanted to answer key questions including how to reduce or eliminate machine setup times, how to at least partially automate the programming



Western Precision Products, Inc. has a high-tech, 48,000 sq. ft. production facility in Tualatin, OR.



Tyler Bureau, Senior Manufacturing Engineer, Western Precision Products said the company purchased *hyperMILL*® to enable programming and running its 5-Axis machines to their full potential.

of complex 5-Axis parts, and how to utilize the latest in Industry 4.0 initiatives to provide a competitive advantage over high-end machine shops. Mr. Tyler Bureau, senior manufacturing engineer at WPP, said “Our vice president Jerry Mullins and I carefully considered our options by using strategies including value stream mapping and examining potential failure modes for this new department. At the end of this analysis, we realized only the leading solutions in each category would be an option for us because they drastically reduced or eliminated failure points.”

This included selecting *hyperMILL*® CAM software from OPEN MIND Technologies. “The first thing you need in a CAM package is trust – trust that it can do the job without limiting your abilities, and trust that it can do it in a safe, fast and efficient manner,” said Bureau. “We purchased *hyperMILL*® to allow us to program and run our 5-Axis machines to their full potential.”

The *hyperMILL*® CAM software suite enables a wide range of powerful 5-Axis strategies for machining challenging geometries, free-form surfaces and deep cavities at maximum efficiency levels. Depending on the geometry and machine kinematics, a user can choose

between 5-Axis machining with a fixed tool angle, automatic indexing or true simultaneous machining. All toolpaths are generated fully automatically with collision checking and avoidance.

PROOF IN PRODUCTION

Since the implementation of 5-Axis machining, WPP has realized an overall 65% reduction in setup time and a 30% reduction in the amount of setup parts, saving thousands of dollars, much of which they credit to using *hyperMILL*®. This has allowed them to pass along savings and deliver parts faster to their customers.

In one example, WPP went from machining a UAV wing spar part on a horizontal machining center to producing the same part on a new DMG MORI 5-Axis machining center. They also transitioned from their existing CAM software to using advanced 5-Axis strategies in *hyperMILL*® and were able to create a better quality part in about half the amount of cycle time than the prior method. Machining strategies now include 5x rework, 5x profile finishing and tangent machining using barrel cutters. “Now the part surface is phenomenal,” said Bureau.

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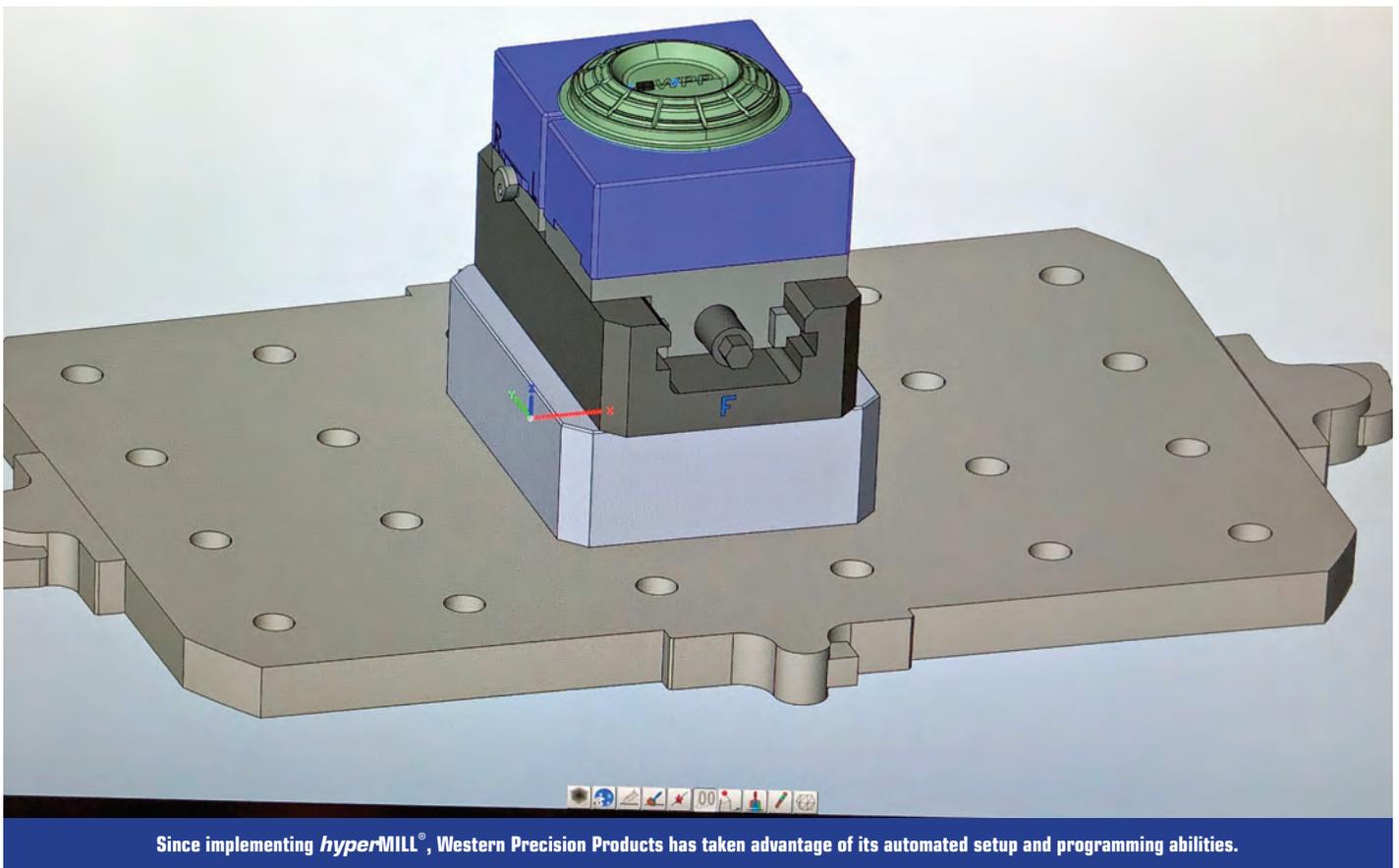


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Since implementing *hyperMILL*®, WPP has taken advantage of its automated setup and programming abilities. For example, it is no longer necessary to program drilled and tapped holes anymore because *hyperMILL*® takes care of it. Bureau said, “We accomplished this by creating a macro database with set rules that look for common characteristics such as hole color, diameter, depth and hole bottom condition, and then make a determination on whether the hole is tapped or not. The macro then pulls the correct tools from the intelligent tool database and automatically programs the holes.”

WPP can also take it a step further and have *hyperMILL*® rough, finish and chamfer pockets as well. And, because all the strategies, speeds and feeds, and depth of cuts for a given tool are saved by material type in the tool database, *hyperMILL*® has allowed WPP to bridge the gap between their experienced and newly hired programmers.

“We have a saying in our 5-Axis department – if you can’t do it conventionally then use the imagination cycle that has become our nickname for the *hyperMILL*® 5-Axis REWORK cycle,” Bureau said. The *hyperMILL*® REWORK cycle is a versatile try-out strategy that determines and displays the exact tool path, then adds collision avoidance and control adjustments to achieve it. “It works beautifully,” said Bureau “*hyperMILL* has also helped us improve our Industry 4.0 initiative by allowing

us to program the digital twin. We sent Open MIND our serialized solid models that match our machine tools exactly, measured our travel limits and now what we see on our screen is what we see at our machine,” Bureau continued.

TRUST IS CRITICAL

Bureau has been in the machining/manufacturing industry for over 20 years and has extensive programming experience. He says he has come to one simple conclusion, “Our industry is addicted to bad CAM. We have come to expect our CAM software to fall short and that is simply not okay.” However, WPP chose *hyperMILL*® because of its dedication to pushing the limits as a trend setter in the 5-Axis community. “When other CAM software companies hear they are competing with *hyperMILL*®, they pay attention,” noted Bureau.

WPP currently has four *hyperMILL*® workstations, which have set the stage for growing its 5-Axis business. Bureau said, “The days of not trusting our posted code are far behind us because of *hyperMILL*®. Today we program a part, walk up to our machines, hit the cycle start and walk away. I have a hunch not many shops can say they believe in their CAM package enough to do that.”

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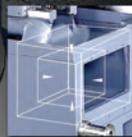
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LIVE TOOLING

Article & Photos Contributed by
Preben Hansen, President, Platinum Tooling Technologies Inc.,



Example of a very large, deep pocket tool that initially seemed too expensive, until the tests proved otherwise.

A BRIEF INTRODUCTION TO THE BASICS OF THIS MACHINE TOOL METHOD, ITS CONCEPTS AND RECENT DEVELOPMENTS IN THE TECHNOLOGY

Live tooling, as the name implies, is specifically driven by the CNC control and the turret of various spindle and powered sub-spindle configurations on CNC lathes to perform various operations while the workpiece remains in orientation to the main spindle. These devices, whether BMT or VDI, are also called driven tools, as opposed to the static tools used during turning operations and are usually customized for the particular machine tool builder's turret assembly.

Most often, live tooling is offered in standard straight and 90° configurations with a wide variety of tool output clamping systems, including collet chuck, arbor, Weldon, capto, whistle notch, hydraulic, HSK, CAT, ABS and a variety of custom or proprietary systems developed by the many suppliers to the industry.

As your jobs change or volume increases or you encounter specific challenges in machining very large parts with deep pockets or very small intricate parts, for example, and the need arises for new machinery, a common error is made by accepting the standard tooling packages provided by the builder. This is most definitely not a criticism of the standard packages from builders, but this article is meant to give you a set of parameters to consider when evaluating the tooling and toolholding devices to use in your shop or production department. Simply stated, you need to do as much evaluation of your



Multi-spindle tool brings improved cutting capacity to your lathe.

process, when determining the proper tooling to be used, as you did when you evaluated the various machines available for purchase.

This examination can range from the simple (external vs. internal coolant, for example) to the sublime (adjustable or extended tooling configurations) to the truly exotic, an example of which will end this article.

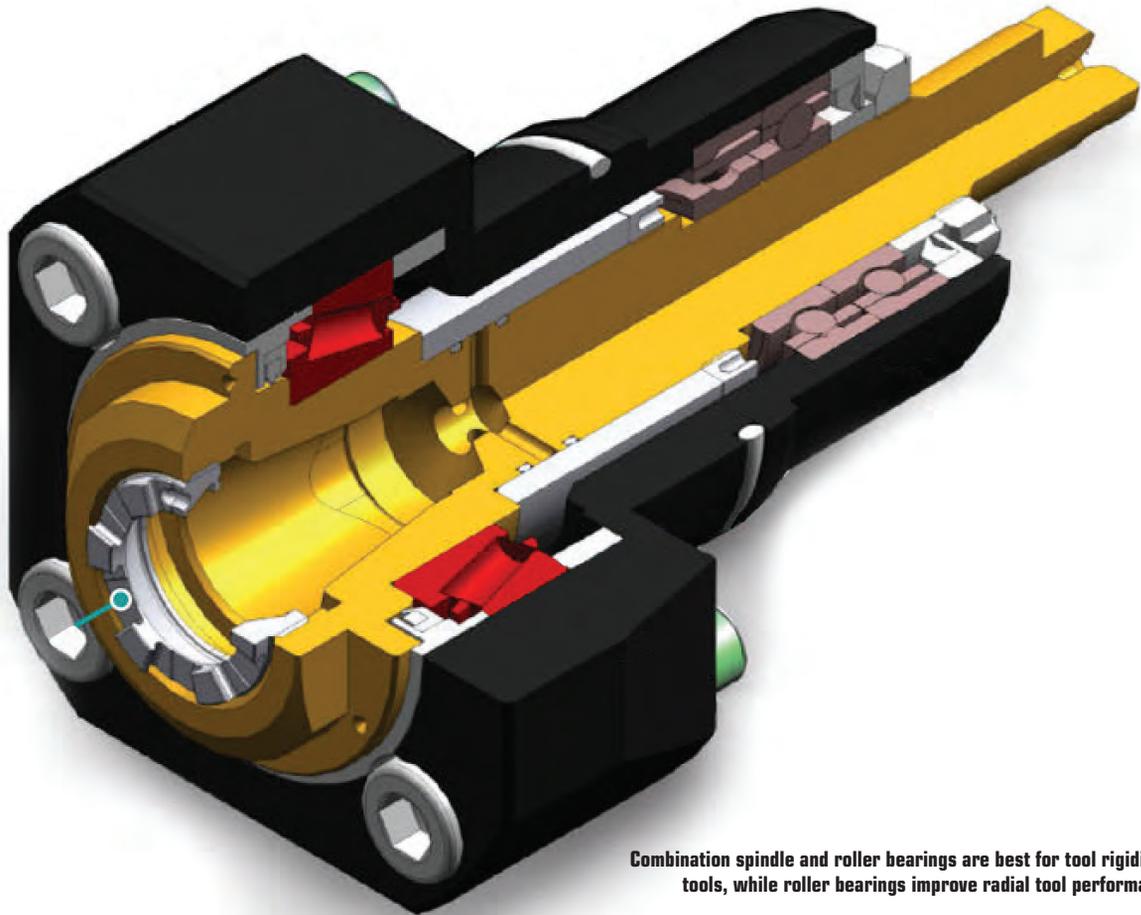
Tool life is the product of cutting intensity, materials processed, machine stability and, of course, piece parts produced. Two seemingly identical job shops can have vastly different tooling needs because one is automotive and one is medical, or one specializes in the one-offs and low-volume work, while the other has a greater occurrence of longer run jobs. The totality of your operation determines the best tooling for the machines being purchased.

Bearing construction and the resulting spindle concentricity drive the life of any tool and you might find that just a 10-15% greater investment in a better design can yield both longer lasting cutters and consistently superior finish on your products. Of course, the stability and rigidity of the machine tool base are also critical factors, especially on large or deep pocket workpieces, where the distance from the tool base to the cutter tip is greater. Bevel and spur gears that are hardened, ground and lapped in sets are best for smooth transition and minimal runout. Roller bearings are consistently superior to spindle bearings in live tooling applications, so look for a combination system to get the highest precision possible. Also look for an internal vs. external collet nut, so the tool seats more deeply in the tool, as superior rigidity will result.

Likewise, coolant high pressure might be desirable. Look for 2000 psi in 90° and 1000 psi minimum in straight tools.



+135°/-30 universal style adjustable tool might be the ideal solution for families of parts.



Combination spindle and roller bearings are best for tool rigidity on axial tools, while roller bearings improve radial tool performance

You need to ask another question, namely, is the turret RPM sufficient to handle the work to be done? It's possible a speed increaser on the tool would be helpful.

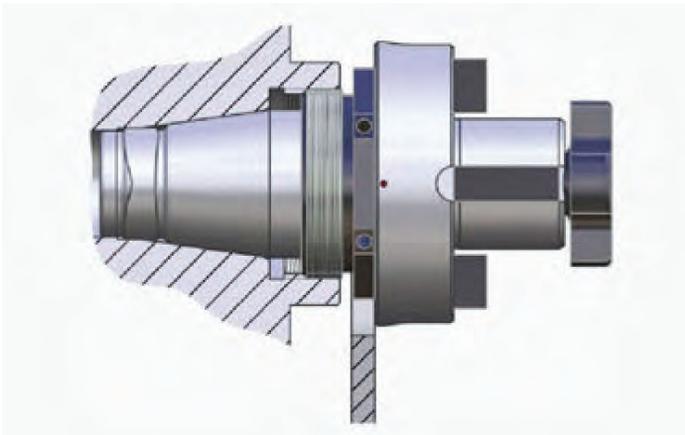
Would it be beneficial to move secondary operations to your lathe? gear hobbing can be accomplished or producing squares or flats through the use of polygon machining.

Standard live tooling most often is best suited to production work, where the finish, tolerances and cutter

life are critical, while quick-change systems may be better suited to the shop producing families of products and other instances where the tool presetting offline is a key factor in keeping the shop at maximum productivity.

This opens the discussion of long-term flexibility and it's the most often overlooked consideration in buying live tooling. What work do you have in the shop, what work will be coming in the future and the overall economies of a changeable adapter system on your tooling may be considerations not often made when the focus is centered on the machine being purchased. Dedicated tools for large families of product may be desirable but consider a changeable adapter system and talk to your supplier before making that determination. Likewise, if the future work you're bidding involves more families of product, think ahead when buying the initial tooling on the machine.

If standard ER tooling is suitable for the work, there are many good suppliers but do consider the construction aspects noted above. For a quick-change or changeable adapter system, there are fewer suppliers in the market, so seek them out and be sure they can supply the product styles you need for all your lathe brands. Adjustable angle head systems can be costly but very worthwhile, owing



A typical ER collet adapter changing system allows faster presetting and improved production

to the stability and rigidity of their construction, when producing families of parts with only slight differences in the dimensions.

Now, one of the exotic examples promised earlier...it evidences the value of having test runs done on alternative tool styles...

One company was doing a cross-milling application on an AL6063 sheave, using an ER40 output tool on a Eurotech lathe, running 10 ipm at 4000 rpm. They were making three passes, with a cycle time of 262 seconds and getting a chatter finish on 20,000 pieces per year. The annual cost of the machining was over \$130,000. By using an improved adapter tool design with ER32AX output and the same parameters, they were able to produce the part in a single pass with a smooth finish and cycle time of just 172 seconds. Over the course of the year, this turned into a savings of \$45,000, approximately 20x the cost of the tool. The bottom line is the bottom line, as the accountants tell us.

In the end, you may not need a +135°/-30 universal adjustable tool or a multi-spindle live holder or even a quick-change adapter system but do consider all the options. Talk to your machine builder and several tool suppliers, plus the most important people in this equation, your shop personnel, as their input is invaluable.

Internal clamping nut seats the tool more deeply



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High School Students Vie for a Win in Los Angeles Robotics Competition

After duking it out in the 20th Annual Los Angeles FIRST Robotics Regional Competition, three victors are moving on to the world championships.

The tension was palpable as six student-built robots vied for dominance at the Da Vinci Schools arena in El Segundo, California, in the second round of the best-of-three final match. Since the Red Alliance had won the first, the Blue Alliance needed a win the second. But as the two-minute round concluded, it was clear that the Red Alliance's victory was assured, and the cheers of hundreds of students, mentors and spectators erupted from the stands.

This action-packed finale marked the culmination of the 20th Annual Los Angeles FIRST Robotics Regional Competition in late February which attracted 44 teams of high-school students from the L.A. area, Nevada, Chile, Mexico, France, Brazil and Turkey. Mentored by experts from a range of aerospace and engineering organizations, including NASA's Jet Propulsion Laboratory, the students constructed robots to save "FIRST City" from being destroyed by asteroids.

The city and asteroids, of course, were fictional, but the challenge — called "Infinite Recharge" — was not. Individual teams formed alliances of three teams, commanding their robots to collect "power cells" (actually, squishy yellow balls) to energize their protective "shield generators." After being collected from the tennis court-sized arena, the power cells had to be shot into the shield generator's open doors. The more balls that hit the target, the higher the score. At the end of the round, the robots (which could be as heavy as 125 pounds, or 57 kilograms) gathered in the center of the arena to employ an extendible arm, latch onto a dangling metal beam and hoist themselves into the air, thereby activating the generator and saving the city.

While engineering is at the core of the competition, the task of building robots in a few weeks, testing them and then competing against some of the world's best high-school robotics teams means so much more to the students.

"As an aspiring aerospace engineer, it's really nice to walk into a place where I can look at a problem, solve it, and then see how other people have solved it, and compete against them," said Brian Di Mascio, a junior at L.A.-area Burbank High School and member of the JPL-mentored Team 980 ("ThunderBots").

This sentiment was shared by Irma Lopez, a tenth grader from L.A.'s Foshay Learning Center and member of Team 597 ("The Wolverines"). "With robotics, not only are you developing the hard skills like wiring and programming," she said, "you're also developing presentation skills, business know-how and understanding the importance of community outreach. Overall it's impacted me in a very positive way."

The competition inevitably brings other, unexpected challenges that help to hone other skills. With only a few weeks to build robotic creations featuring varying degrees of automation — including auto-tracking turrets that could identify the balls' target using code written by the students — anything could go wrong. This was particularly true for Chile's Team 5512 ("Pizza Mecánica").

"We came to the U.S. with the robot in our suitcases," said team member Valentina Flores. "We built the robot in Chile, but we then had to take it apart and reassemble it when we got here. We found that parts didn't fit as they should."

They managed to get rolling with a little determination. "It was hard and stressful, but we are here and we have a robot ... or at least something that looks like it!" said teammate Joaquim Rodriguez.

The 2020 Los Angeles regional's winning Red Alliance was composed of Team 987 ("Highrollers"), Team 4201 ("The Vitruvian Bots") and Team 6000 ("Firehawk Robotics"); all three will progress to the world championships in Houston in April. Team 1444 ("Peñoles Cerbotics") from Mexico will also advance to the championships after winning the prestigious Chairman's Award, which recognizes the team that reflects sustained excellence in the FIRST community and beyond, serving as role models while educating the public about FIRST.

The annual global tournament is organized by the non-profit FIRST (For Inspiration and Recognition of Science and Technology) to encourage students to embark on STEM careers.

For its commitment to the challenge, JPL received FIRST's "Volunteer of the Year" award, the first time the honor has been given to an organization and not an individual.

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Chris Parker, owner and founder of Rottweiler Performance has brought his experience as a world class fabricator into a worldwide brand. Those who live life on two wheels know Rottweiler Performance, appreciate the quality, and understand that sometimes you just gotta let the big dog out. Chris Parker describes Rottweiler Performance as a design and manufacturing facility with the primary goal of creating useful products to customize motorcycles.

Chris began fabricating in the early 80's when he was given a shot at working by a local Orange County, CA fab shop. He had a knack that earned him jobs throughout the southeast. He hit the big time when he got a job

as a fabricator at Rod Miller Motorsports. It was a baptism by fire and a crash course in brain surgery all in one. "Rod Miller Motorsports at the time was one of the top off-road rally racing teams in the world," says Chris. "Here I was a young welder/fabricator being part of the world record breaking Phil's Peak Hill climb team. I know then that I wanted motorcycles to be a permanent part of my life." Having his father Chris from the top of the Rockies to the beaches of Bali as a race driver, tuner, fabricator and team owner. The day CNC West was on site interviewing him Chris was busy prepping the team for the upcoming Sonoma Rally, a 5-day long endurance event that they had entered on an adventure like

CPR (Chris Parker Racing) came about around the turn of the century. The focus was on products like high-end exhaust and intake systems for race cars, pedal systems and anything that needed an expertise that only a fellow racer could understand. "I had talent as a welder" explains Chris. "That's fabricating is a good welder who can solve puzzles. Racing brings with it something that puzzles to be solved. By word of mouth I began to gather a following. All my customers came from referrals and I was able to blend fabrication with machining to solve any con-

So much of the world has stopped in the last month, but we know manufacturing doesn't. Large and small shops are out there making parts and keeping us rolling. As a thank you CNC West Magazine would like to give you a little boost in exposure. Show your colleagues what you are up to, tout your services and really showcase who you are. Whether you have a marketing department sending out info or if you are a one person do everything kinda shop here is a chance to shine in front of your peers. Submit your 500 word company profile article to us via email along with 5 full res photos for us to pick from and we will feature your company in print or on our website. **FREE** press is the best kind so help us help you get the word out that you are cutting chips and keeping the country going strong.

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FANUC ROBODRILL AND METHODS AUTOMATION INCREASE PRODUCTION OF FAMILY OWNED MANUFACTURER

Article & Photos Contributed by
Methods Machine Tool

TIMNEY TRIGGERS USES THE FANUC ROBODRILL WITH AUTOMATION TO DECREASE THEIR PER PART TIME.

Timney Triggers is a second generation family owned Phoenix, Arizona based manufacturer of aftermarket triggers. They have been building the worlds' finest triggers since 1946 with a mission of providing a lifetime of accurate shooting by producing the best quality precision trigger. By innovating and listening to their customers, Timney is now producing more than 170 models of triggers for bolt-action rifles, shotguns, AR rifles and semi-automatic rifles.

Timney was first introduced to Methods in 2012 when they were looking to solve a production issue by reducing time on a per part basis while being able to retain the quality that they have become known for. Methods

Arizona sales manager Bob Nakash, worked with Calvin Motley, new product development at Timney Triggers, on a time study to show him the capabilities of the FANUC RoboDrill.

After purchasing a few RoboDrills and seeing the performance first hand, Timney decided to increase their production capabilities by pairing the RoboDrills with Methods Automation and the Job Shop Cell. Timney worked with the team at Methods Automation who designed a turnkey to fit their needs. The Timney cell includes an infeed conveyor, an outfeed tray, a re-gripper station, and a LR Mate FANUC Robot with three grippers to handle the raw material and finished parts. The Robot's third gripper hand and re-grip station allows the part to be flipped over and placed back into the RoboDrill so the backside can be milled.



The RoboDrill Job Shop Cell has helped Timney decrease their per-part-time by 30% which is extremely important as Timney is running thousands of parts daily. The RoboDrill JobShop Cell allows Timney to load up a block of 6061-T6 aluminum and end up with a finished part.

By stocking the infeed conveyor Timney is able to expand their production to run unattended overnight.

For the overnight production we realized that if we slowed down the process it reduced wear and allowed the machines to be more effective and run continuously through the night without stopping," said Calvin. Timney is currently running one shift so the ability to run the RoboDrills overnight without stopping allows them to keep up with production needs.

"There are a lot of great machines out there but the service at Methods has lead us to get machine after machine," said Calvin.

The FANUC RoboDrill is a high-performance machining center, known worldwide as the most reliable machine manufactured today. RoboDrills make quick work out of any milling, drilling or tapping jobs. Reliability has also been

addressed in all areas of the machine design. Coupled with the latest FANUC31i-B5 control, the RoboDrill is the preferred machine in any manufacturing facility large or small. "We've stuck with Methods and the RoboDrill platform because of the success we've seen. Once you've gotten one or two, you see why you need to stick with it," said Calvin.



"There are a lot of great machines out there but the service at Methods has lead us to get machine after machine," - Calvin Motley

Covid19

Let's MAKE SOMETHING Out of This

Michael Larsen

Marketing Director at HAINBUCH America Corporation

In current business jargon, the term “disruption” refers to an event, a product, an innovation, or a concept that forever changes an entire industry. The origination of such a disruption is thought to propel a relevant business to a leading market position. In a wider sense, though, the term can have a far more inclusive meaning. And, such is the case with the current Coronavirus Pandemic.

The global nature of the event and the steps being taken to control it will forever alter both personal lifestyles and the infrastructures in business, industry, and government that impact them.

For those of us in manufacturing, the immediate effect can be traumatic, but the ultimate reality is that, whatever the outcome, products will have to be made and services delivered.

Within this context, tremendous change will be taking place. The sudden realization of the vulnerability caused by our dependence on offshore manufacturing and materials, especially in critical areas such as pharmaceuticals, will require relocation of such facilities to our own shores. The economic relationships that came about thanks to our reliance on lower cost imports will need to be reevaluated and revised.

While all of this will take time, the end is clear: there will be a profound increase in manufacturing in the United States, but the complexion of our manufacturing base and the infrastructure supporting it will be markedly different. Just as every major “disruption” or change provides significant opportunities, it also requires that those who wish to participate in it, and profit from it, engage in a serious review of their tools, methods, and processes. This is especially true in three key areas: flexibility, adaptability, and capability.

- **Flexibility.** The rapid emergence of new materials (including ever harder alloys, ceramics, composites, and glass), the emergence of new and refined technologies (such as additive manufacturing, multi-spindle machining, and robotics), as well as the radical redesign of components coming about due to the incorporation of AI in the design process demand that both large manufacturers and shops be prepared to meet challenges radically different from today's conventional manufacturing. The knowledge base of both designers and producers will have to be considerably broadened to define the correct choices.

- **Adaptability.** The ability to quickly and effectively adapt to major challenges will require a major reconsideration of the business model. In the current Coronavirus Pandemic, the shortage of critically needed ventilators is being answered by major automotive manufacturers who are repurposing portions of their facilities to mass produce the necessary units. While

this may seem like a radical change to the public, in reality, it will be accomplished in a comparatively short time. The fact is that the designs and the programs for the components of these units already exist. By securing the correct materials and importing them into the proper tools, it will be possible to move rapidly from the factories' traditional outputs to the new devices.

As manufacturing moves forward and the number of disciplines and required areas of expertise proliferates, cooperative efforts in the design and manufacture of components and products will, of necessity, become more common. Shop owners and manufacturers that have historically thought in terms of moving from design to finished product will now be interacting in both long- and short-term partnerships to achieve the desired end result.

- **Capability.** Among the most immediate changes that the manufacturing community will be obliged to deal with is the continued proliferation of “hard to machine” materials and shorter runs of complex parts. As many are currently discovering, success in this area demands a thorough-going reevaluation of tools, machines, and accessories. Modern materials frequently require both higher speeds and precision workholding for effective machining. When it comes to assets such as turning centers or machining centers, the apparent economics of this can be staggering. Faster obsolescence is already becoming a factor, although retrofitting existing units with equipment such as high-precision, fast-change, workholding units on turning centers and multi-axis capability on machining centers can go far in easing the burden. As with computers, controls, and other electronic devices, manufacturing machinery will experience a shorter service life than has historically been the case.

The Second World War was responsible for the development of many things that made the post-War period one of great prosperity. One of the most significant but least visible had to do with the fact that the individuals who left military service to enter the management community were experienced with working under duress and understood the value of teamwork. As such, it was through their vision that the United States not only became the unquestioned leader of the Free World but also participated in rebuilding the economies of our Allies and even our former enemies.

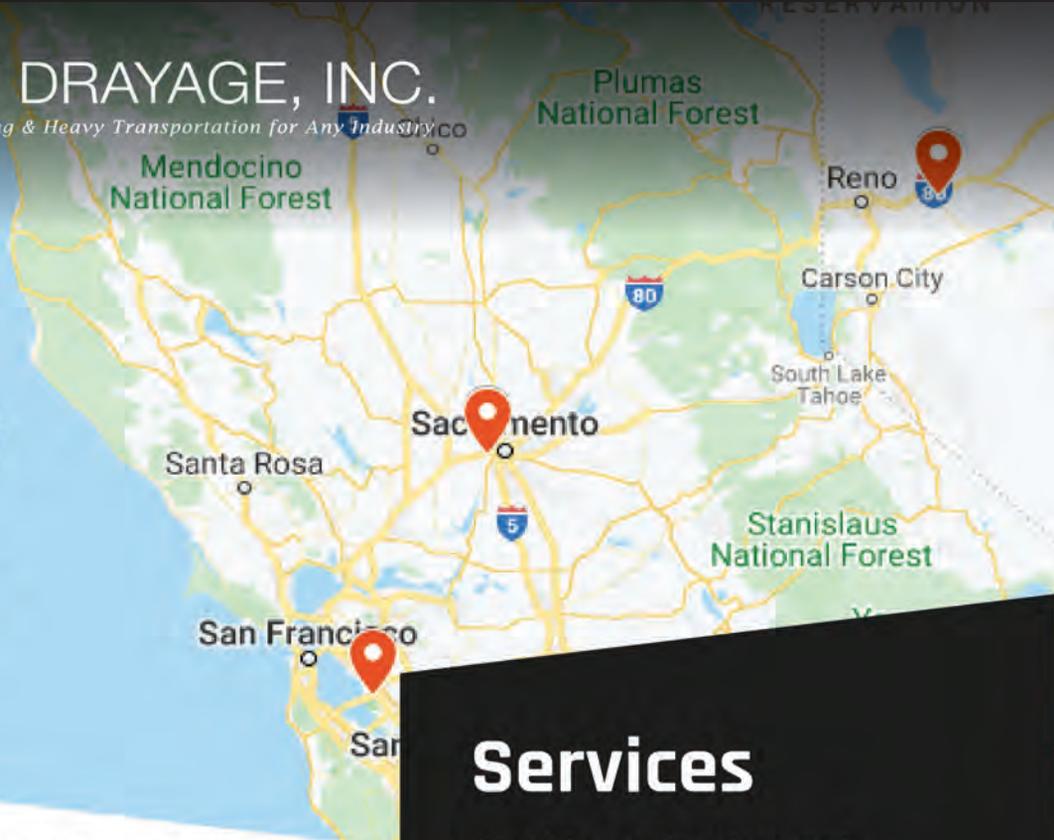
The current disruption in manufacturing will likewise require participants to undergo a major adjustment of their views on all aspects of the process. The result will be a more effective and efficient system operating at a greatly increased pace.

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Industry News



DMARK Names Serrano as VP and General Manager

DMARK Machine & Tool Company has named Robert Serrano as its new VP and General Manager. Serrano has more than 30 years of experience in the machine tool industry. He has worked in executive and technical positions for major machine tool builders and importers including GF Machining Solutions, Tornos Swiss, Methods Machine Tools and Ganesh Machinery.

Robert's broad experience includes a hands-on background in service and applications, expanding into field sales and sales management.

He has implemented organizational changes and sales growth strategies based in the improvement of marketing tactics.

He has led his team in developing programs to spread the company's presence nationwide and to increase brand awareness.

In addition, Serrano has managed key customer relationships, built and executed growth plans, assembled dealer networks, implemented manufacturing training programs and increased revenue.

In Robert's words, "I have known and worked with the team at DMARK for many years, in various capacities.

DMARK is passionate about the support of the customers they serve. I am here help manage that tradition by expanding our offering of high-quality machine tool products, while always improving our sales process."

NTMA Announces Roger Atkins as New President

The National Tooling and Machining Association (NTMA) board of directors has appointed Roger Atkins as president. Atkins joins the association following a successful career in contract manufacturing and in consulting for manufacturing companies. He previously held every officer position for NTMA at the national level, including serving as NTMA chairman in 2012, and served in every officer position in the Houston, TX, NTMA chapter.

"As a longtime member of NTMA, Roger knows and understands our association and its members," said NTMA board chair Mark Lashinske.

Atkins began his career at his family's contract manufacturing business, immediately after graduating from Texas A&M University. Over the years, he spear-headed significant growth in multiple contract manufacturing companies, all of which also belonged to NTMA. His greatest success was growing a Texas-based contract manufacturing company from \$22M to \$156M that included acquisitions and international greenfield startups.

"As we welcome Roger, we also express our gratitude to Doug DeRose who has served tirelessly as NTMA's



Interim President," Lashinske said. "

NTMA is the national representative of the custom precision manufacturing industry in the United States. NTMA has 29 chapters throughout the U.S. and nearly 1,200 member companies.

Matt Erickson to Lead Sales at TCI Precision Metals

TCI Precision Metals announces Matt Erickson as director of sales for the company effective immediately. Matt brings with him extensive experience in industrial operations, sales, program management, and a customer-first management style.

"We feel Matt is a perfect fit for TCI Precision Metals and are looking to him to provide expanded hands-on customer interaction, both in the field and through our internal sales and customer service team," said Ben Belzer, president and COO.

The company continues to invest in people, equipment and processes to further extend its value to customers, by eliminating material prep and other time-consuming operations, such as hogging out or adding features that require large amounts of material removal.

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Industry News

Precision Cutting Technologies Announces Acquisition of Supermill, LLC

Precision Cutting Technologies, Inc., has acquired Supermill LLC ("Supermill"). Precision Cutting Technologies holds Alleghany Capital's investments in the precision automated machine tool and high-performance cutting tool sectors. Supermill is a leading manufacturer of high-performance carbide end mills.

Terry Derrico, president of Precision Cutting Technologies, commented, "We are excited to partner with Tom Hale, founder and president of Supermill, as well as his talented and experienced team of associates. The acquisition of Supermill enhances Precision Cutting Technologies' portfolio of cutting consumables and strengthens its position in the Northeastern United States. As in our past acquisitions and reflective of our strategic partnership approach, Tom will continue to lead the company post-transaction and Supermill's day-to-day operations will not be impacted. However, we believe that Supermill will now be able to take advantage of the infrastructure and national sales reach of the Precision Cutting Technologies platform."

Tom Hale added, "I founded Supermill in 1990 with the goal of manufacturing the highest quality end mills for the metal working industry and providing our customers with unmatched performance and tool life. After thirty years of growth, I am happy to have found a long-term home for the company and our loyal employees."

WS Tool Group Acquires Intrepid Tool Industries

GWS Tool Group announced that it has acquired Intrepid Tool Industries. Intrepid is the first add-on acquisition in 2020 for GWS.

Located near Phoenix, with approximately 100 employees and operating out of a 35,000 sq. ft. facility, Intrepid

is a provider of carbide, HSS and PCD cutting tools to the aerospace sector, with a special emphasis on threaded-shank and/or brazed construction drills,



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The advertisement features a central circular graphic showing a 3D simulation of a CNC machine tool cutting a part. The background is dark blue with yellow and white accents. The text is in white and yellow. At the bottom, there are three small inset images showing different simulation scenarios, including one with a red starburst indicating a crash detection.

Industry News

reamers and countersinks.

“Intrepid could not have been a better fit for our organization,” said Rick McIntyre, CEO, GWS. “In addition to this investment establishing a substantial physical presence on the West Coast on which to further build, Intrepid’s product and service portfolio is the perfect complement to our already dynamic offering. With acquisitions like Intrepid, we continue to get very close to there being nothing within the cutting tool supply chain we cannot address with some of the most precision products in the world.”

Mr. Rafael Boldorini Named General Manager at Romi USA

Romi announced it has named Mr. Rafael Boldorini as general manager of Romi Machine Tools Ltd (Romi USA), the Brazilian based company’s USA operations. Mr. Boldorini has been with the company since 2004, and is now responsible for all operations, marketing, sales, and customer support in the US market.

Upon graduating from São Paulo State University in 2004 with a degree in Mechanical Engineering, Mr. Boldorini accepted a position with Romi as a trainee, where he gained valuable experience in engineering, production, marketing, and sales. He simultaneously



continued his education, earning an MBA in Business Management from FGV, the São Paulo School of Business Administration, and then an MBA in Marketing from the University of São Paulo. At Romi, he quickly worked his way up to sales, team management, and then sales branch management.

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Industry News



Dave Hauck Celebrates 40 Years at Kenbil Engineering

Dave Hauck started at Kenbil Engineering in 1980 as a territory manager. Over the years he has worked his way up the ladder to his current position of president.

Kenbil Engineering has been in business for 60 years and is a well known manufacturers rep agency based in Riverside, California. Their territory includes California, Nevada, Arizona and Utah and they have resident sales people in all of these states.

Lines they represent include Hougén, Kurt Vises, Mitee Bite, Cogsdill and more.

2020 Masters of CAM Wildest Parts Competition Now Accepting Entries

Mastercam, CAD/CAM software developed by CNC Software, Inc., is proud to sponsor a competition to inspire students and professionals in the manufacturing arena. The 2020 Masters of CAM Wildest Parts Competition is now accepting entries.

The challenge is simple. Create a bold, original item using Mastercam. The competition challenges students and professionals to create something that shows off imaginative design and exciting machining.

Participating in the Wildest Parts Competition is a great opportunity for

instructors and students to get inspired in the classroom and motivated to expand their CAD/CAM abilities by the spirit of competition. Entrants are

expected to create high quality parts that either haven't been done before or add a new twist to an existing concept. Now until June 30, 2020, entries

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Industry News

will be accepted in four divisions: Secondary (1st, 2nd, 3rd) – open to individual students at high school level of education. Postsecondary (1st, 2nd, 3rd) – open to individual students at college/university level of education. Teams (1st, 2nd, 3rd) – open to groups of students at any level of education and Professional (1st, 2nd, 3rd) – open to anyone with professional manufacturing experience.

All entrants receive a Mastercam t-shirt for participating. Winning entries receive cash, \$3,000 for first place; \$1,500 for second place; and \$500 for third place, in addition to certificates of achievement and more. Anyone interested in a manufacturing and design challenge to break the mold, think

outside the box, cut outside the lines, and share their creativity is encouraged to enter.

For more information visit <https://www.mastercam.com/community/competitions/>.

Sumitomo Joins OMIC R&D

The Oregon Manufacturing Innovation Center Research and Development (OMIC R&D) recently welcomed Sumitomo Electric Carbide Inc. (SCI) as its 30th member. Sumitomo, whose U.S. subsidiary is headquartered in Chicago, is based in Hyogo, Japan, and is said to be one of the largest carbide



manufacturers in the world, focusing on cemented carbide, cubic boron nitride (CBN) and sintered diamond cutting tools.

Craig Campbell, executive director of OMIC R&D, says, “Sumitomo shares OMIC R&D’s desire for ac-



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Industry News

tive and engaged members. They are known to have a technology-first mentality and they bring unique solutions to the discussion that will help us solve industry's machining challenges. Sumitomo possesses an energy and excitement that fits very well with our hands-on approach to solving problems."

Kazuyoshi Kimura, president of SCI says, "Sumitomo development and innovation of high-performance, cutting-edge material technology through powder metallurgy and super-high-pressure techniques will contribute to the innovation of manufacturing technologies through the activities at OMIC."

EXSYS Tool Celebrates 25th Anniversary

EXSYS Tool Inc., the exclusive importer of EPPINGER tool holders, adapters and specialty products, celebrates its 25th anniversary this June. For a quarter-century, EXSYS has served as an industry-leading supplier of CNC tooling and tool holders, including innovative products like the PRECI-FLEX® modular tool holding system and a wide range of high-precision live and fixed toolholders for turning centers.

EXSYS was established by president and CEO Stewart Bachmann and Craig Campbell, who served as vice president of sales until 1998. Originally an acronym for "Expert Systems," EXSYS began as a business launched by Walter Bachmann, Stewart Bachmann's father, who had previously served as a director of manufacturing planning and had considerable experience with the production of special tooling.

"My father started his business out of our house in California, with boxes of tool holders stacked up on the wash-

ing machine," recalls Bachmann. "But he did some significant volumes with that infrastructure – and his knowledge of working with EPPINGER to develop specialized manufacturing

solutions. So when Craig and I moved out to the Eastern time zone to start our branch of EXSYS, I used what I learned from him to push our sales and applications expertise even further."

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Initially, the new branch of EXSYS remained focused on the sale of axial and radial toolholders, products the company has refined and optimized over the years. The company increased its capacity year after year, eventually forming an exclusive distribution partnership with EPPINGER.



Hexagon Supports Manufacturing Professionals Working From Home

Home working options will be provided for Hexagon's production software and metrology software offerings, as well as the MSC Software range of CAE solutions, until at least June 30, 2020. Manufacturers running metrology equipment in factories can remotely monitor and

analyze how key assets are performing for free with HxGN SFX | Asset Management. Users will also have access to additional online learning resources.

"The purpose of our smart manufacturing solutions is to improve quality and productivity and this challenge is especially acute during this time of extensive home working," said Paolo Guglielmini, president of Hexagon's Manufacturing Intelligence division. "So, to support the industries we serve, we're offering special access to our

software and learning tools for both current customers and non-customers who can benefit from our technology."

"Like many businesses in the manufacturing sector, we have many employees working from home at the moment and we appreciate that giving them the right tools to work remotely is essential to their wellbeing and success. By offering learning and remote-working solutions, I hope we can contribute to maintaining productivity and quality while keeping employees in manufacturing safe."

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Industry News

Mastercam Vice President Becomes Ambassador for Manufacturing Community

CNC Software, Inc., the developer of Mastercam CAD/CAM software, has announced that owner and executive vice president Brian Summers is transitioning to a new role in the organization. Summers will retain ownership responsibilities but is stepping away from executive duties as vice president to embark on a new journey as an ambassador for the manufacturing community.



Working with his brothers, Summers was pivotal in starting CNC Software in the early 1980s from a home office and growing the business to what it is today. Over the decades, they evolved Mastercam from a few toolpaths to a name brand provider of CAD/CAM to the global manufacturing community. "The business they started, still operating as a privately held family operation, now employs hundreds and is connected to the world market with a world-class reseller network, providing sales, training, educational services and technical support to clients around the globe," said a company spokesperson.

CNC Software president and CEO Meghan West said, "Brian's involvement in the manufacturing industry and as a leader of our company for the last 30+ years has been the reason for many of the positive interactions with the product and support that our customers experience today. I have been so fortunate to have him as a mentor, a business partner, an uncle and a friend. I am so excited for Brian as he moves on in his new role, continuing to

build and strengthen relationships with our resellers and partners that are the cornerstone of our business."

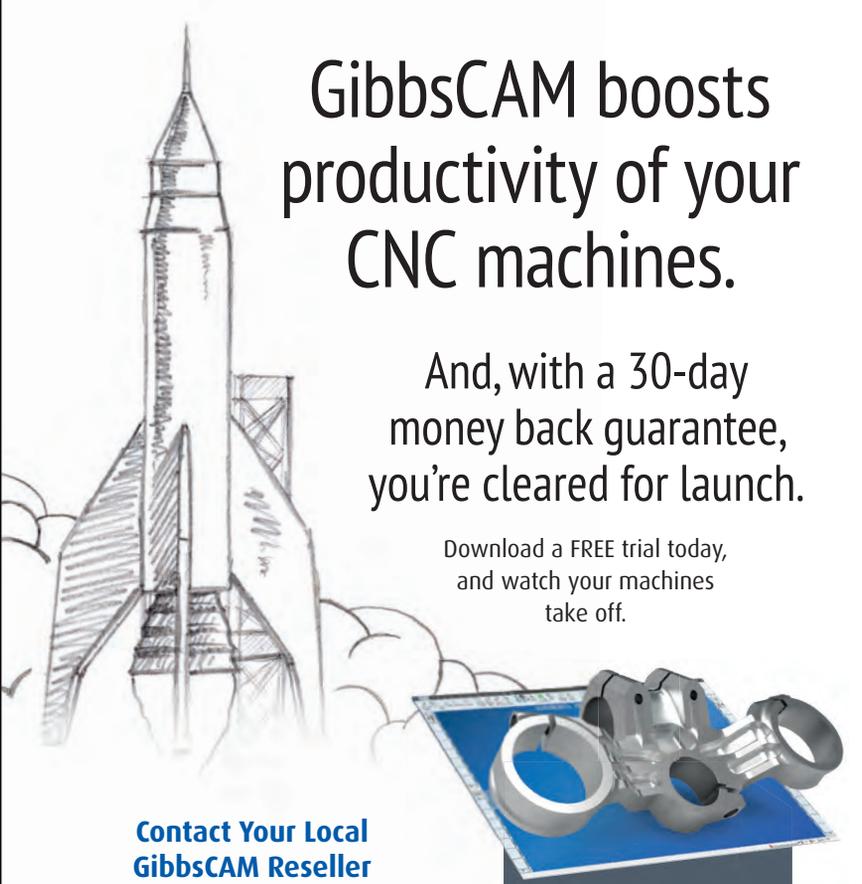
Summers has developed an extensive group of contacts over the years

working for his family business. In his role as ambassador, he will spend time traveling to meet with clients and other prominent players to share stories of innovation and accomplishment in the manufacturing industry.

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Industry News

Verisurf Software Announces Free Online Training Courses

Verisurf Software is offering its comprehensive online metrology training courses free of charge. Now through June 30, you can access Verisurf University dimensional metrology courses including, Inspection, CMM Programming, Reverse Engineering, and Guided Assembly.

“We are in the midst of an unprecedented event of global impact, and I hope everyone reading this is safe and healthy while the world comes to terms with COVID-19. The Verisurf Team would like to provide everyone with the opportunity to learn Verisurf and expand their skillset. We are pleased

to offer training to help people gain an advantage in the future,” said Ernie Husted, president, and CEO.

Verisurf University offers 24/7 online training to anyone seeking to learn employable job skills needed in today’s technology-based and automated manufacturing environments. The Verisurf training platform is hosted on the popular immerse2learn Learning Management System (LMS) designed by educators to present learning content that is aligned with certification standards, such as NIMS.

In addition to the course work, a FREE version of Verisurf Learning Edition is included and connects to all supported portable and programmable CMMs and 3D scanners. Don’t have access to a device? No problem, in-

spection programming, and simulated inspection routines can be accomplished using your mouse.

Register for your FREE Verisurf online training course and download your FREE Verisurf Learning Edition software at the Verisurf website.

Out of an abundance of caution and social responsibility, Verisurf employees are currently, and for the foreseeable future, working nearly 100% virtual, using technology and remote access. We are committed to supporting our many customers, who remain on the job, manufacturing to support the needs of national health and safety, and critical infrastructure. We will get through this together.



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New Products



New Style OD Clamps —Mitee Bite

Mitee-Bite Products just completed the design and development of a new style Concentric Outside Diameter (OD) clamping tool. Repeats within tenths, compact for high density application and tough enough to limit yourself to tooling capabilities. This Patent Pending design can be machined to hold any shape, completely through clamp and fixture plate as well as gripping workpiece above compression nut. 15° incremental laser engraved indicators on large cap (22.5° on small cap) for applying repeatable torque without torque wrench and for applying preload (15°- 45°) when machining clamps to actual workpiece dimensions.

New Grooving Tool Holder —Walter

The new Walter G4014-P grooving tool holder is ideal for small part machining operations such as swiss type machining. The system offers an innovative new “SmartLock” insert clamping feature to access the clamping screw from the side.

This makes it possible to change inserts in the machine – even where space is limited—in particular on long center lathes and multi-spindle machines. The clamping screw can be accessed from either left or right side; thus, the operation of the tool from either side is possible, making it a very flexible system.

The patent-pending positive en-

gagement design of the insert seat also contributes to the flexibility. The cutting insert is seated in the insert pocket with an innovative prismatic design. This prevents incorrect engagement, especially for narrow insert widths, and enables an extremely high level of

indexing accuracy. The Walter grooving system consisting of G4014-P and DX18 inserts is available in the shank sizes of ½- 5/8 in. and 10–20 mm, with insert widths from 0.059-0.118 in. and for parting off diameters of up to 1.38 in.

The holder designs are offered with either precision cooling on the rake and flank faces or without internal cooling

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New Products

TungCut Grooving Tool with Coolant Supply —Tungaloy

Tungaloy has expanded its TungCut series of grooving tools to include the CGP32-CHP parting blade with the ability to internally supply high-pressure coolant.

TungCut features rigid insert clamping that provides reliable tool life and excellent groove quality during parting operations, the company claims. The CGP32-CHP parting blade enables the tool to internally supply high-pressure coolant to the cutting edge for better chip control, extended tool life, and higher cutting parameters. In addition, TungCut inserts offer various geometries and grades that excel in parting off operations.

VMC Handles Large Workpieces in Small Footprint —Okuma

Okuma's Genos M660-V vertical machining center combines a large work table, a compact machine footprint and a CAT 40 Big-Plus spindle for machining large, complex parts. An optional CAT 50 Big-Plus spindle is also available for heavy cutting jobs. The larger table minimizes restrictions on workpiece size and tool length while leaving ample space to add rotary tables, the company says. The table measures 60.24" x 25.98.

The machining center is built with Okuma's Thermo-Friendly Concept technology, giving it the ability to withstand thermal deformation during the machining process. The technology



is also said to eliminate the need for machine warmup. The rigid, double-column construction reduces vibration for less wear and tear on critical machine components as well as improved machining performance. The Genos M660-V is also one of the heaviest machines in its class, according to the company.

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New Products

High Feed Drilling Solution

—Iscar

Iscar's new Logic3Cham, the next evolution in the Sumocham family of self-clamped replaceable carbide tipped drills, is designed to boost drilling productivity up to 50% according to the company. "The 3-flute design accomplishes this with advanced technologies, producing smaller chips that help in chip evacuation, which is usually a major limiting factor in successful drilling at high feedrates. The user-friendly system allows for quick change of the drilling head on the machine with no set-up time," said a company spokesperson.

Logic3cham drill heads are available in diameter ranges of .472" to



1.020" in .004" increments. "The drill head geometry is suitable for both ISO P and ISO K material, and with a PVD TiAlN coating will provide prolonged/predictable tool life," said the spokesperson. The patented concave cutting edge and self-centering point allow

for easy initial hole start on surfaces with up to 12° of inclination without the need to machine a flat or pilot hole. The unique wavy cutting edges help to produce smaller chips for easier chip evacuation, while a patented robust chisel point and gash angle help withstand high cutting forces. The 15° chamfered corners increase wear resistance and strengthen the corner.

The drill bodies are available in 1.5, 3 and 5 x D with both a cylindrical shank as well as a flat. The 3-flute drill design not only allows for higher feedrates with the additional flute, but also provides an inherently stable drill with helical margins capable of handling challenging machining environments that occur during interrupted drilling operations.

The new closed pocket design



Premium Economical CMM

LK Metrology's new ALTERA C offers reliable measurement results and efficient throughput for measurement tasks in industrial and shop floor environments. Innovative design features have resulted in a surprisingly compact footprint, making the ALTERA C an attractive proposition when floor space is limited.

Available in three sizes 7.7.5, 10.7.5 and 10.7.7. A range of multi-sensor technology is available to meet varied customer applications and budgets, including: 5-axis PH20, industry standard PH10, low cost automated RTP20, manual MH20i and fixed head PH6.



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New Products

avoids plastic deformation, allowing rigid clamping and increased number of drill head indexes. The bodies also feature large polished flutes to aid in chip evacuation. Drill bodies below .591" will accept five different drill head sizes for .020" drill diameter range while utilizing the same body. The larger drill bodies will allow for 10 drill head size changes for .040" drill diameter range.

Mill-Thread Inserts for Machining Long Threads —Carmex Precision Tools

Featuring multiple straight flutes designed for machining longer threads in small to large diameters, Carmex Precision Tools' Slim MT inserts and toolholders are engineered for high productivity. The inserts, most of which are double sided, are constructed of an advanced carbide and coating combination for extended tool life. The toolholders are nickel coated for high wear resistance and feature a unique clamping mechanism.

Jim White, national sales manager for Carmex USA, said, "The new Slim MT line was developed to offer customers a quality tool for generating

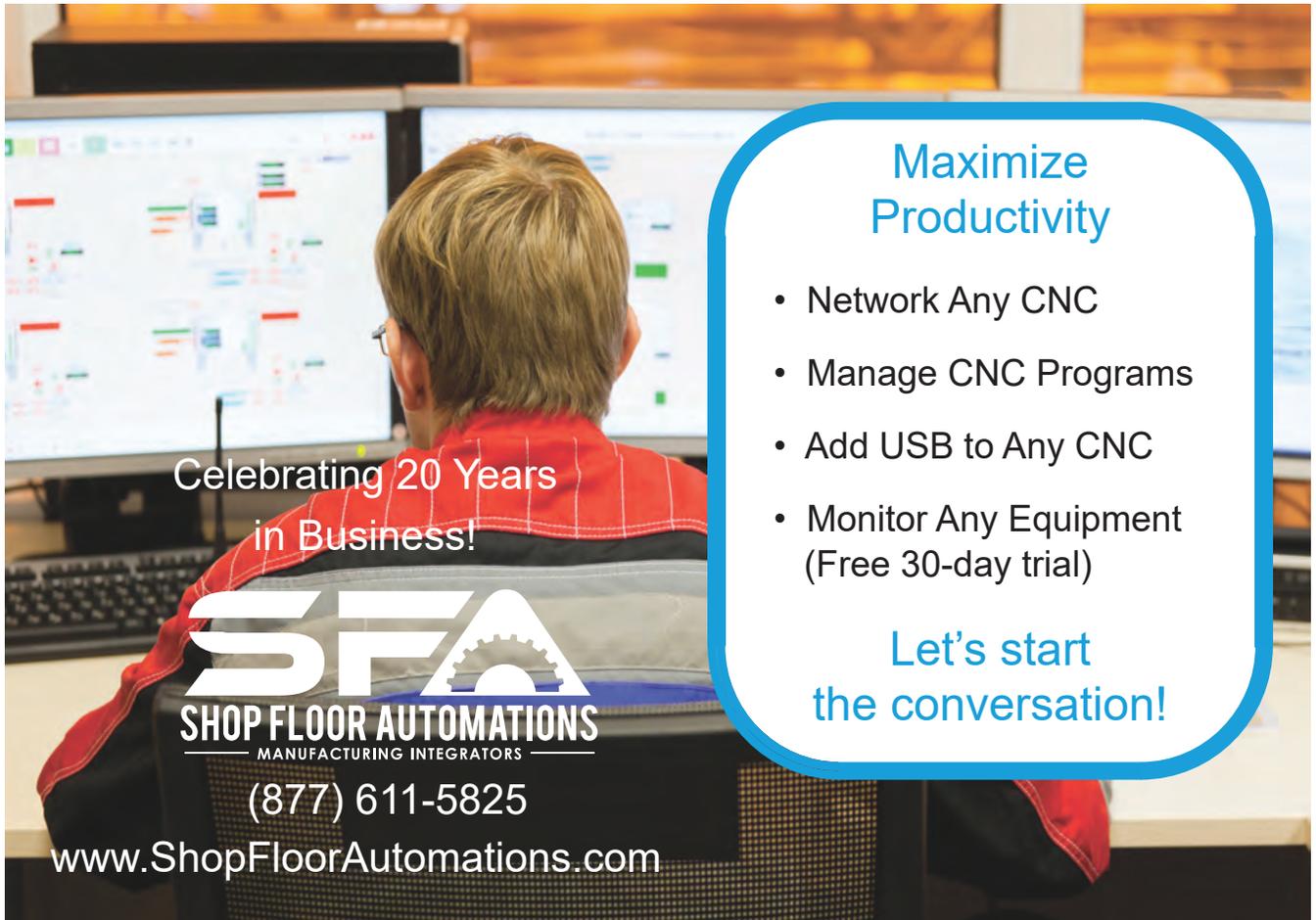
longer threads in an economic package. The longer inserts not only make deep hole threading easier but also deliver an excellent finish with less cycle time. Slim MT holders and inserts are available in a wide variety of sizes and multiple international configurations."

New Drill Family with Corner Protection—Guhring

Guhring has introduced a new drill family to the United States: the RT 100 XF. "A new proprietary carbide grade, developed by Guhring specifically for the RT 100 XF, provides wear resistance to meet the demanding requirements of high production machining

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and durability to survive in less rigid machining conditions,” said a company spokesperson.

The nano-FIREX coating has been improved by utilizing a specialized pre- and post-treatment process, which smooths out the coating.

“Corner protection, achieved with a negative chamfer along the side of the cutting edge, creates an extremely tough and durable cutting edge with exceptional performance,” said the spokesperson. The micro-geometry honing process provides a uniform hone, resulting in a stable and efficient cutting edge.

“The RT 100 XF’s concave cutting edge, relieved cone point and micro-geometry hone yield an extremely smooth surface finish. This design results in increased operating parameters

and extended tool life due to the decrease in cutting forces and operating temperature,” said the spokesperson.

“Double margins engage immediately, resulting in improved concentricity and straightness, as well as excellent surface finish,”

continued the spokesperson. “Polished flutes improve chip evacuation, significantly reducing machining temperature, which prevents work hardening and protects the cutting edges.”

RT 100 XF drills are available with coolant through for 3 mm to 20 mm diameter and 5xD and 7xD lengths. These drills are engineered to excel in steels, but can also be successfully applied in stainless steels, cast iron, Ti/Ni alloys and hardened steels up to 45 HRC.

Small Electric Press Brake

—MC Machinery Systems

The BB306, is a fully electric press brake designed with a smaller footprint to fit any facility and form smaller parts.

“The new machine comes with the same standard features customers have come to expect from MC Machinery, including an integrated all axis pulse handle, thickness detection, multi-axis back gauge, front and back LED lighting, and large user-friendly control,” said a company spokesperson.

It comes with the new MOS control found on all BB and BH series, and 100% Mitsubishi electronics, motors and servo drives featuring an AC servo motor and ball screw drive mechanism for high speed productivity and repeatability. The machine’s design includes a folding front table, 5-axis back gauge and a tilting controller.

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PATENTS PENDING

New Products

Form Compensation Option to Numroto —NUM

A new form compensation option for NUM's Numroto tool grinding software enables tool manufacturers to close the loop between CNC tool grinding and measurement in order to increase process accuracy and consistency. The system inherently compensates for process variables such as temperature fluctuations and grinding wheel wear.

Operators seeking to maximize the accuracy of tools produced on CNC grinding machines generally use a coordinate measuring machine (CMM) to obtain probed measurements of the machined part, using this information to influence the production process

during subsequent machining operations, the company says. Until now, Numroto users processed the results from the CMM with third-party compensation software running on an external computer before feeding a corrected target profile back into the CNC machine.

Developed in conjunction with several key end users, Numroto's form compensation capability forms a fully integrated part of the company's form cutter package and eliminates the need for third-party software, NUM says. The data exchange between the CMM and the CNC machine can be handled by XML interface or by export/import of the DXF file via a local area network.

The form compensation software employs advanced filtering algorithms

to create a smooth and precise compensation profile. The software always calculates the orientation of the grinding wheel and the path speed from the original profile so that only the position of the contact point on the cutting edge is compensated, not the orientation of the grinding wheel. This ensures that the surface quality of the tool is unaffected by the compensation, according to NUM.

The form compensation option is compatible with Numroto version 4.1.2 or later

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New Products



Hard Jaws Feature Diamond-Shaped Serrations for Increased Pull Down Effect

— Dillon

Hard Jaws from Dillon Manufacturing, Inc., feature diamond shaped serrations for increased pull down effect which reduces part slippage and

push back from using a bar feeder. The aggressive serrations on the gripping surfaces are also ideal for cast parts, scaly parts or parts with imperfections. Manufactured of 8620 steel and case hardened with precision ground locating surfaces. The jaws are black oxide coated for corrosion resistance. The hard jaws are available in one-step or two-step sets and are reversible for OD or ID chucking. Only one set is necessary to cover a wide clamping range.

Dillon hard jaws are available in standard sizes from stock and in different mounting configurations including serrated, T&G, Acme, and square serrated key types to fit all brands of chucks. Dillon also offers special or modified hard jaws.

Dillon Manufacturing, Inc. manufactures a complete line of standard and custom workholding solutions including chuck jaws, chucks, vises jaws, soft jaws, hard jaws, collet pad jaw systems, chuck lubrication, and more. All products are made in the USA and Dillon is ISO 9001:2015 registered.

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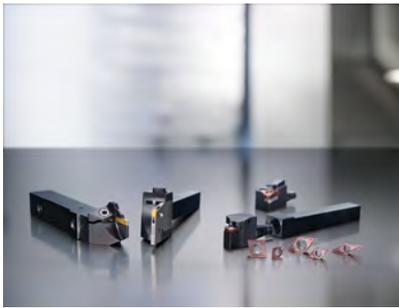


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New Products



QC Modular Toolholder Simplifies Swiss-style Machining —Seco

Seco Tools has introduced a modular toolholder system for manufacturers seeking to improve their productivity with Swiss-style machining. The system enables fast, easy and repeat-

able insert indexing and tool changes outside of tight machine work spaces.

The QC (Quick-Change) Toolholders also feature Seco Jetstream Tooling® and Jetstream Tooling® Duo technology for optimal chip control, high-quality surface finishes and extended tool life.

New Unique High Accuracy Ring Encoder Resists Contamination —Heidenhain

Heidenhain introduces a new mid-range high accuracy ring encoder that is suitable for position measurement applications that require high tolerance to contamination but do not demand the accuracy level of an optical encoder.

This unique Heidenhain ERM 2203 is optimized to meet those needs.

The new Heidenhain ERM 2203 ring encoders are most suitable for applications such as gear-wheel grinding machines and others that require similar high accuracy but must operate in an often-contaminated environment.

The sturdy ERM 2203 retains the 200 µm signal period as other current ERM products, though the graduation error has been reduced by approximately 30%. Also, the interpolation error has been cut in half and reversal error has been negated according to Heidenhain. All of these improvements enable this ERM 2203 to be mechanically and electronically compatible to other Heidenhain ERM and can be substituted in those applications that require a higher level of performance.



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New Products

The ERM 2203 series is currently available in the 1Vpp interface with both distance-coded reference marks and single reference marks. Other interfaces will soon be available.

High-Speed Production Machines — JTEKT Toyoda Americas

JTEKT Toyoda Americas Corporation and Ace Micromatic Group have formed a strategic alliance to offer a complete range of high-speed production machines to their customers. JTEKT Toyoda Americas has signed a long-term agreement to be the exclusive importer of the entire Ace



Micromatic machining line.

Immediately, Toyoda will be introducing several new specific machine classes to its production product range.

Among these machines is the Gemini XL Twin Spindle vertical machining center. The twin spindles, combined with fast linear guideways and traverse rates of 1,968 ipm (50 m/min), makes the Gemini XL series best suited for industries with high-volume production such as automotive, aerospace, and medical.

The MCV450XL vertical machining center is another machine from the production line series – equipped with an integrated rotary pallet changer with factory integrated overhead hydraulics, a 12,000 RPM direct drive spindle, and Fanuc fine mold package with 400 block look ahead.

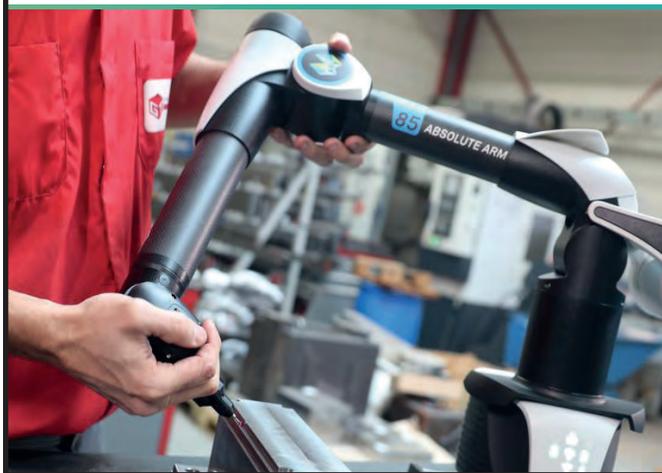
Also available is the DTC-400 XL high-speed drill tap machining center.



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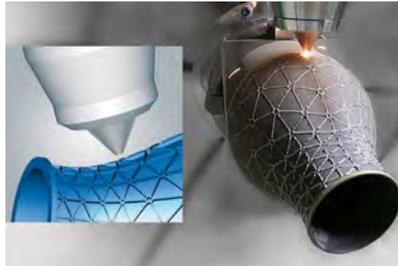
New Products

This compact, powerful machine is loaded with high-speed spindle options, up to 24 tools, and rapid feedrates up to 2,362 ipm (60 m/min).

Additive Manufacturing Capability for hyperMILL® CAM Software —Open Mind Technologies.

OPEN MIND Technologies AG, announced it offers an Additive Manufacturing capability option in hyperMILL® CAM software to support 3D printing/ additive processes. hyperMILL® together with Additive Manufacturing also provides efficient hybrid processing with simultaneous additive and subtractive processing on one machine.

For highly complex 5-axis simul-



taneous processing, hyperMILL® ADDITIVE Manufacturing enables an array of flexible options for Directed Energy Deposition processes (DED) and Wire Arc Additive Manufacturing (WAAM). Both laser-based powder nozzle machining heads and WAAM can be controlled using hyperMILL® ADDITIVE Manufacturing for selective material deposition, as well as conveniently programmed and automatically simulated for collision avoidance.

Mr. Alan Levine, managing direc-

tor of OPEN MIND Technologies USA, Inc. said, “As an early adopter of driving forward the implementation of integrated process chains, OPEN MIND has optimized hyperMILL® Additive Manufacturing technology to boost the efficiency, precision and process reliability of additive and hybrid manufacturing.”

Using Powder Bed Fusion (PBF) and any necessary rework, hyperMILL® supports the full potential of additive manufacturing. “If 3D-printed parts do not have the desired surface finish, or has support structures that have to be removed, the parts, including hard-to-reach areas, can be machined after being printed using 5-axis cutting processes,” Levine said.

Key additive applications include repair of damaged components, cladding of additional surface skins, or creation of new components from a substrate.

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New Products

Multi-Purpose Autogrip Power Indexing Chucks with Hydraulic Feed —Global Tooling Solutions

Global Tooling Solutions, LLC has introduced Autogrip power indexing chucks. “Indexing chucks are designed to machine a variety of cast or forged parts with intersecting axes, such as valve bodies, couplings, joint spiders, trunnions and others,” said a company spokesperson. “They are perfect for large plants producing challenging components with a high number of part runs, such as the auto industry, and can also be an invaluable contributor for smaller machine shops.”

“Indexing chucks can be installed



on standard turret style NC/CNC lathes and can perform a full range of machining processes, such as turning, boring, drilling, threading and other operations, in one set-up,” continued the spokesperson.

Indexing chucks can provide versa-

tility and increased machining capabilities for standard NC/CNC machines.

Autogrip indexing chucks are versatile and suitable for both rough and finish machining. They offer high precision automatic indexing while spindle is turning, along with high rigidity and repeatability along with large clamping capacity and high clamping force. Automatic indexing covers 4 x 90 and 8 x 45 indexing options. Every chuck is provided with a pressure drop detection safety device

Chucks can be mounted on a variety of turret-type NC/CNC lathes. All parts are made of high quality hardened steel, are precisely ground and are directly lubricated during the chuck clamping process and are sealed against swarf, chips and coolant.




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New Products

Safe Machine Door Actuator System Expands Automation Potential —Dynatect

Dynatect offers a door actuator retrofit system for safely automating virtually any horizontal machine door type: single-door, bi-parting door, or doors with telescopic-leafed sections. The Safe Machine Door System (SMDS) is a flexible solution to support manual loading, robotic loading or other automation initiatives.

The system offers switchable motion profiles supporting differing types of automatic loading that may occur on the same machine. The SMDS Retrofit System is available in three sizes – small, medium, and large – for doors with opening widths up to 69 inches. It



includes the door drive unit which contains all the mechanical components to operate a single or double-leafed door and can be easily installed within one shift. No additional control cabinet is required, nor are additional safety elements required such as bumper bars or light curtains. After connecting

the power supply (115-400 VAC) and control signals, the drive can be commissioned in approximately 15 minutes with the intuitive SMDTuner software.

Per EU machinery directive 2006/42/EC, every machine manufacturer is obligated to conduct a risk assessment for every machine. There is a crushing hazard on every machine with movable guards and special safety measures must be considered for machines which are operated by a person. Protective machine door actuators supplied by Dynatect include the technology for implementing a safe force and speed limit for horizontal doors with door weights up to 750 kg. The door actuator's protective function triggers an immediate change of direction if an obstacle is encountered.

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New Products

Ultra-Compact MID-Size HMC Offers High Speed —Kitamura

Kitamura Machinery introduces the Mycenter-HX300iG/400. Manufactured in Japan with premium grade castings the HX300iG/400 offers customers heavy duty cutting performance, while providing an impressively large work envelope within an 8' x 12' footprint.

The Mycenter-HX300iG/400 offers up a huge work envelope of X-Axis =18.1", Y-Axis= 20.1", and Z-Axis 22" with a Max. workpiece diameter of Ø19.7", max. and a workpiece height of 29.3". A newly available 400mm table option offers additional work holding possibilities.



It offers a powerful, 30HP, 15,000rpm, #40 taper, direct drive, dual contact spindle. A 20,000rpm high speed, dual contact spindle is an available option.

The HX300iG/400 is automation

ready and field expandable up to an 8-station pallet pool for unmanned operation potential. FMS connectivity is an available option. The standard fully integrated 4th axis rotary table with Integral Drive motor enables high speed rapids of 150rpm.

A field expandable 50-tool fixed pot ATC allows for the addition of up to 200 tools as needs change. A fast 1.3 sec. T-T change contributes to the reduction in overall cycle time.

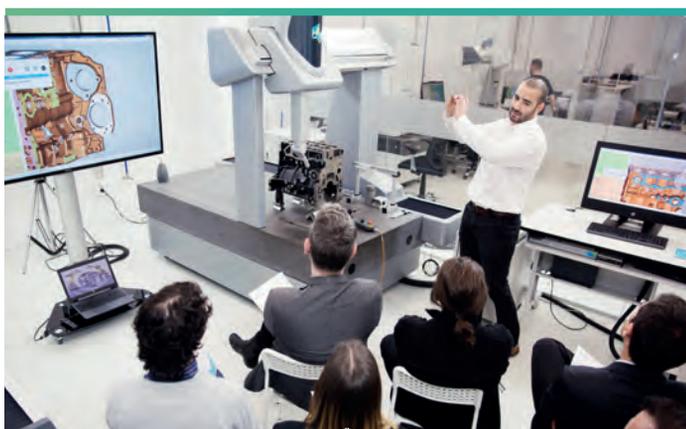
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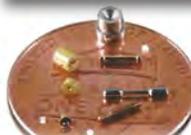
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Shown above: Micro machined parts with table salt

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Software Broadens DRO Use to Include EDM Machines—Heidenhain

Heidenhain Corporation's Acu-Rite brand has introduced a new software for its versatile 300 Series digital readout (DRO) that now allows users to control a sinker EDM machine. This

new development broadens this established DRO's use to include all of the most common manual shop machines such as milling, turning, grinding and now EDM in a single DRO.

When ACU-RITE's new EDM software is loaded into a DRO300 and coupled with an IOB 610 interface box, it enables the simple control of sinker EDM through the use of three relay signals. This software is now included on all new multipurpose DRO300s. For those who already own an ACU-RITE DRO300, v1.3.1 can be downloaded for free on the Software updates page www.acu-rite.com

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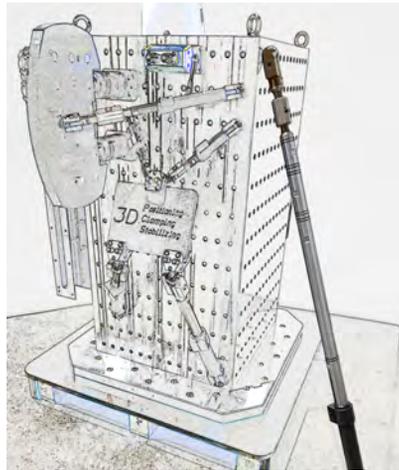
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New Products

Maximize Stability with Stabilizer 50 System —BIG KAISER

BIG KAISER Precision Tooling, has introduced the UNILOCK Stabilizer 50 System for UNIFLEX Ball System. This modular system provides lateral support for tall parts during machining, welding or assembly processes and allows for the transfer of loads to the table or base.

The importance of stability across the metalworking industry impacts everything from profitability to employee safety. If there's a need to back off feeds and speeds to achieve finishes, there's a good chance a part is not completely stable. BIG KAISER's zero-point, UNILOCK stabilizer sys-



tem can easily adjust to any new part. BIG KAISER reports that in place of modifying parts by moving them from machine to machine, and in-

roducing the chance for error, this stabilizer system can easily adjust to each new part. The system attaches to the worktable and the side of the workpiece to provide lateral support. As the workpiece gets taller and further away from the table, there are cutting forces pushing against it and the stabilizer helps to offset them.

The UNILOCK Stabilizer System also can be used for mobile parts that are odd shapes and sizes. No matter the part, they are easy to adjust within one job, or in the case that jobs are changing in and out rapidly. What's more, integrating it into existing setups is quick. The system stacks easily and uses a wide variety of gripping forms.

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New Products

Automated “Pusher” Bandsaw

—Quicksilver Engineering

Quicksilver Engineering introduces Bandsaw Cut Master for fast, automated cutting with minimal operator supervision.

Cut Master’s ability to cut any menu of lengths make it valuable to fabricating shops cutting a variety of parts. Its speed and ease of operation make it attractive for mass production.

Cutting is done automatically with agile air cylinders that vise material and control the saw arm. The operator loads stock on the infeed, sets the controls, and Cut Master does the rest.

Cut Master is built around quality Kalamazoo, Victor, Bolton, or Rung Fu



10” saws with operator safety features. The machine cuts 10” rounds and rectangles up to 18” wide.

Cut Master includes standard infeed and outfeed sections for handling stock material. The infeed has a positioning bar that quickly pushes material stock through the saw in one measured stroke. It handles a full 20’ long stock,

and cuts any length, accurate to .001. The 10’ outfeed supports the part being cut, then drops away after the cut to channel parts into bins.

It has special features that result in full use of material. It cuts stock material down to a ¼” remnant, reducing waste and avoiding operator intervention to process stock ends. It easily cuts different lengths from stock material.

A touch panel provides a simple, intuitive control panel with 100 lines of memory. User friendly controls allow both automatic and manual cutting, material positioning, and inch/centimeter measurements. There is a special control button that makes end cuts. A parts counting feature counts up to 100,000 parts from multiple



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New Products

stock feeds.

Cut Master includes a liquid coolant system delivered to 2 carbide blade guides, emergency switches, stock rollers, guide rollers, outfeed ramp, outfeed roller, work lamp, and blade brush, with 14 elements that are adjustable for high efficiency.



RS-SQUARED Area Scanner for the Absolute Arm – pairing for the first time an area scanner with a portable measurement arm. It is designed for high-speed scanning of simple shapes and surfaces.

By combining the flexibility of a

portable arm with the speed of structured light scanning technology, RS-SQUARED takes up to four square ‘tiles’ of 3D point data per second, while maintaining the high accuracy measurement of the touch probe, even in difficult to reach areas. Because RS-SQUARED does not require reference markers or employ fringe projection like other similar scanners, the time necessary to scan the part is reduced to the absolute minimum.

The RS-SQUARED Area Scanner is the perfect complement to the existing range of scanners, sensors and probes that are already available for Hexagon Absolute Arms, representing

Ultra-fast 3D White Light Scanning Comes to Hexagon’s Absolute Arm —Hexagon

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New Products

an ultra-high-speed alternative most suited to large parts with lower detail requirements. Just like the current RS6 and RS5 Laser Scanner systems, the RS-SQUARED can be easily removed from the arm at any time and swapped for another sensor or probe without any need for calibration.

Together with the release of this new scanner, Hexagon has also announced new control packs for the latest generation of absolute arm systems. Both new control packs will offer complete functionality over a single cable, helping to significantly reduce shop floor clutter. The high-end Wireless Pack model will also deliver full-speed scanning performance over WiFi

for all absolute arm scanners, including the flagship RS6 Laser Scanner and the new RS-SQUARED Area Scanner, along with dual hot-swappable batteries for all-day power.

Hold up to 10 Parts in One Vise

—Sveconek LLC

Sveconek LLC has introduced a new high capacity workholding system that can hold up to 10 parts in a single acting machinist vise. The systems are comprised of an array of unique floating jaw plates that fit between and interact with the existing

movable and fixed jaw plates of the vise. The systems are engineered as an easy to mount and simple to use accessory that fits most 6" vises. Its unique design is offered in different sized kits to accommodate the endless array of sizes and shapes of parts that need to be held. The components of the kits are offered individually to add to and further expand the machinists workholding needs.

The new patented technology is a novel approach to high capacity workholding. "Sveconek's systems hold up to 10 parts as firmly, accurately and repeatably as two parts being held in a conventional vise," said a company spokesperson. "Additionally, the mul-

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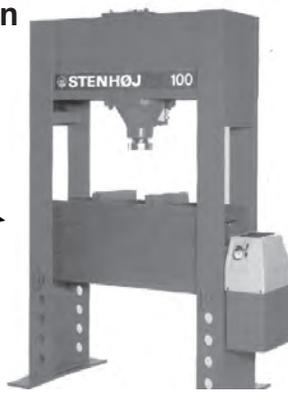
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New Products



multiple clamping and unclamping operations that occur over a production run are simple to execute and do not diminish the systems performance.”

All kits and components are offered in three versions: 7075 aluminum jaw plates with an “integrated step” for typical 1st operations that hold on sacrificial material. Step dimensions are 0.125” wide x 0.115” deep, step seat resides 1.6350” +/- 0.0005” above vise ways. Overall dimensions: 1.25” x 1.75” x 6.0”. Jaw plates anodized for lifelong protection. The second version is 7075 aluminum jaw plate blanks that are machinable for part specific needs. Overall dimensions are 1.00” x 1.75” x 6.0”. Jaw plates anodized for lifelong protection. Another version is 6061 aluminum jaw plate blanks that are machinable for part specific needs. Overall dimensions: 1.00” x 2.00” x 6.0”. 6061 jaw plates are intended to be carved again and again to accommodate workholding needs. Jaw plates anodized for lifelong protection.

Fiberglass Routers Designed for Manual, CNC Cutting —YG-1

YG-1 offers a series of four solid carbide fiberglass routers designed to handle machining of fiberglass and other high-performance fibers. These new routers are said to be optimized in composition, cutting angles, flute strength and stability for longer life and lower cost per part. Four differ-

ent cutting ends make these fiberglass/composites routers ideal for roughing, finishing, edge trimming, slotting, grooving, drilling or interpolation, achieving the same quality results on a CNC machining center or hand routing, the company says.

The Type I (NC end) is mostly for side milling, roughing or finishing passes to achieve a high-quality finish. Type II (burr end) is designed for plunging without damaging side flutes. Type III (mill end) is best for surface milling molds or grooving with surface finish requirements. Type IV (drill end) can be used as a router and a drill and is designed for interpolation to achieve final hole diameter or slotting with a corner radius.

More applications include machining in carbon fiber, Kevlar and other aramid blends, natural fiber-based composites and thermoset resin/thermoplastic blends.

The tools’ double-angle point geometry is designed to counteract or eliminate the machining problems typically encountered with carbon fiber reinforced plastic (CFRP) characteris-



tics. The CVD coating increases abrasion resistance from the fibrous materials and extends tool life. Combined with guidance margins and open flutes, these specialized routers also drill holes with no dust jams or pressure overload, the company says. Suited to manual hole-making, countersinks and counterbores, hand drilling reduces delamination and fiber pullout.

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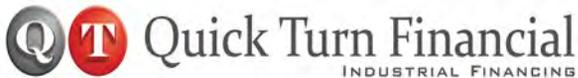
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...Hotline Continued From Page 8

Southern California Defense Firm Is Acquired

El Segundo-based Kellstrom Defense Aerospace Inc. has been sold to a Northern California-based competitor but will keep its ties to Los Angeles County as part of a portfolio managed by Odyssey Investment Partners in Woodland Hills, CA.

Kellstrom specializes in engineering and manufacturing parts used to refurbish older military aircraft and helicopters, as well as distribution and repair of OEM spare parts.

The company has about 400 employees and facilities in Camarillo, Chatsworth and Chula Vista as well as other states and countries. Its customers include Lockheed Martin Corp., Raytheon Co. and Northrop Grumman Corp.

Kellstrom's new parent, Livermore, CA.-headquartered Aero Precision Holdings, which was acquired by Odyssey in 2016, offers similar parts distribution services, but mainly for international clients. Aero has about 300 employees and finished 2019 with about \$175 million in revenue from a client roster that includes Honeywell International Inc., Collins Aerospace, CEF Industries and Eaton.

The growth was spurred in part by the U.S. government's increased reliance on older airplanes like the F-16, according to Celtruda, because newer aircraft such as the F-35 or the P-8 Poseidon "are so incredibly expensive."

Boeing Joins Renewable Energy Buyers Alliance

Boeing has joined the Renewable Energy Buyers Alliance (REBA) in support of its goals to reduce greenhouse gas emissions 25% by 2025, and ultimately power operations with 100% renewable energy. This alliance of large clean energy buyers, energy providers, service providers and NGO partners supports a large-scale, rapid transition to a cleaner future.

"This move demonstrates Boeing's commitment to environmental responsibility," said Beth Schryer, Boeing vice president of Facilities & Asset Management. "Boeing is shifting into a new era, where we must focus on a zero-carbon energy path forward. Joining the world's largest corporations in a global sustainability effort is the right thing to do for the planet."

REBA membership expands Boeing's leadership in the use of renewable energy and energy efficiency. Two Boeing sites - Renton, Washington, and Charleston, South Carolina - use 100% carbon-free electricity through a combination of renewable energy consumption and carbon

offsets from renewable sources. The company is also ranked 16th on the EPA's Green Power Partnership Fortune 500® Partners List, and has been named an EPA ENERGY STAR® Partner of the Year for nine years running.

Vocademy Permanently Closed

Sad state of affairs as CNC WEST did an article on Vocademy a few years ago. The following was in a letter from its owner and creator Gene Sherman.

"As you may know, on Monday March 16th we announced a temporary closure due to the events caused by the COVID-19 pandemic. We were hoping that would be all. But due to the State of California order mandating business and school closures, we do not have the financial resources to continue. Therefore Vocademy Skills Discovery & Training Center has ceased operations permanently on Friday, March 20th 2020.

Over the last few weeks, because of the CoronaVirus, three of our largest clients (schools and charters) were forced to close until the end of the school year. These contract cancellations immediately removed 70%-80% of our revenue for the foreseeable future. In addition, many of our current students did not wish to attend class and other potential community students told us they will not be signing up because of virus fears. We are a small business and, unlike a public school, our revenue does not come directly from educational funding.

South Korea to Get Six Boeing P-8 Subhunters

After four missile launch tests by its aggressive northern neighbor this month, South Korea has finalized an order for six Boeing P-8 maritime patrol and reconnaissance jets as part of the U.S. Navy's latest production order.

The Republic of Korea Navy is expected to begin receiving its new subhunter spy planes in 2022, Boeing said as it announced a production order for a total of 18 P-8A jets which it received from the U.S. Navy, worth \$1.5 billion. Eight other P-8s are going to the U.S. Navy and four are headed to the Royal New Zealand Air Force.

The jet deals are made through a complex foreign military-to-military sales process under which Boeing must seek and obtain Congressional notifications and approvals. The U.S. State Department gave its approval for the deal in 2018.

5th Axis.....12	Hanwha18	Pacific Swiss.....73
Acer29	HEIDENHAIN BackCover	PerformanceMachTIs31
Acu-Rite Co. BackCover	Henning Software71	Platinum Tooling77
Advanced Measurement Machines40	Hexagon Metrology69,73	Precision Tool40
Aero Form Tech81	Hogue Machinery13	Productive Robotics.....11
All AmericanSIs&Serv1	Howards Machinery.....78	Qmark.....75
Allied Machinery61	HS&S.....81	QPlus.....72
Barton.....69	Hurco83	QuickTurn Financial.....81
BC Barfeeds81	IMTS17	Renishaw.....56
Can Do Machinery.....77	ISCAR.....7	Rosco Precision.....83
CG Tech.....53	Industrial Surplus.....77	Royal Products71,76
Chevalier41	Jergens.....57	R Tec31
Complete Automated Manu- facturing.....59	Kaiser Tool Co25	Saracione Manufacturing 65
CME.....78	KD Capital Equip81	Selway Machine Tool.....2
CNC Solutions13,83	King Machine.....40	Shibaura Machine.....33
D & R Machinery83	Lawson Drayage.....51	Shop Floor Automations .64
Daystrom Technologies ...59	Lista52,58,64,66,67,74	Southwestern Industries
DIL76	Kitamura13	Inside Back Cover
Doosan21	LK Metrology63,80	Standard Time75,81
Dynatect62	Lyndex Nikken54	Star CNC9
Ellison Technologies21	Machines In Motion80	Sulli Tool81
Engineered Product Ser- vices62	Machinery Sales13,83	Sveconek.....80
Fagor. Inside Front Cover	Mastercam/CNC Software.6	Taiwan Takisawa.....31
Femco.....16	Mazak19	Thinbit.....25
Foothills Machinery.....83	MCT.....45	TQS40
GMN USA.....74	Methods MachineTIs.5	US Shop Tools..14,15,58,66
Gen Swiss10	Mini Mover81	Valley Financial.....74
GibbsCAM59	Mitee Bite.....79	Verisurf55
GTS Tools.....70	Nikon60	Webb Prec Mach68
Haimer72	NuTech Machinery.....80	WesternMetrolgy SIs40
	Nyman Machinery.....9	Whipple Enterprises81
	PM Machine.....67	YCM.....39
	Pacific Machine76	Zeiss,Carl IMT30,40

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