

CNC WEST

Volume 36 - Issue 2

THE MAGAZINE FOR WESTERN METAL WORKING MANUFACTURING

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 - **JOB SHOP IS CHANGING LIVES THROUGH SOCIAL ENTERPRISE**
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CNC West

December 2017/January 2018 • Volume XXXVI No 2

Feature Stories

Plano Fiber Evo Laser Technology20

Quality is Number One at FUTEK

An Irvine sensor maker uses Zeiss to help insure everything is perfect22

Toxic Perfection is a Character Asset

A southern California watchmaker relies on his Kitamura . 32

Changing Lives Through Social Enterprise

A San Diego shop teaches ex-inmates to become machinist 40

Verisurf Announces Faro Software Solution Suites46

The Advantages of Non -Woven Abrasives for Right Angle Grinding.....48

CAD/CAM/CNC Perspective

Tim Paul asks what it takes to grow a machine shop..... 52

Departments

4	Editorial	56	Industry News
8	Executive Hotline	66	New Products



For more than three decades, So-Cal based FUTEK Advanced Sensor Technology, Inc. has committed to making the highest quality sensors available in the test and measurement industry.
- Pg.22



Over the last 25 years Josh Ogle has appeal to the hard-core watch nerds who want a legitimate American made watch. Not an Apple Watch, not a fashion watch, but a hand crafted timepiece
-pg 32



Santee, California based Rise Up Industries Inc. Is not your typical job shop.
- Pg.40

Coming in February/ March 2018

This issue will look at the aerospace and defense industries. These two industries are vital to the west coast, especially the Pacific Northwest and southern California. We will have articles on shops that specialize in these two industries and the machines and methods that make them successful.

Editorial: Jan 18, 2018

Ad Space: Jan 22, 2018

Ad Material: Feb 1, 2018



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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 Love to Feature Shops that want to be Heard

Getting stories for this magazine is not as easy as one might think. We probably get 95% of our story leads from companies that make or sell machinery, software, tooling and or quality products that we have a relationship with. A lot of times a salesman will tell me that they have a customer with a shop that they think would be a great story. While they might be, once we contact them they are quite hesitant to have us come and do a story. Reasons for not having us do a story vary from being too busy, doing government work that can't be discussed, not wanting attention or not wanting their competitors to know what they do.

And while sometimes the people change their minds and let us do the story, you can tell that their heart is not in it. Our editor Sean Buur has called me more than a few times telling me it was like pulling teeth to get any information from some of these companies. Now you might not be able to tell it from the quality articles that Sean writes, but some of these articles are not easy.

That was NOT the case this issue. We have three articles from companies that were very excited to have CNC WEST visit their shop and write about them. In fact, a couple of them actually say so in the article about their shop. Our cover story is about a company in Irvine, California that makes sensors. These sensors are very precise, and the company relies on their Zeiss machine to insure that they are up to their high standards.

Another story is about a southern California watchmaker. Sound familiar?? Well we did have what turned out to be a popular article about a watchmaker in the October/November issue and hopefully this one is just as interesting. The owner was quite excited to have CNC WEST visit his shop and let him have the opportunity to let our large readership learn about what he does.

Our third story by Sean Buur is about a shop in the San Diego area that has taken on the task of helping those that have paid their debt to society in jail and teaching them a trade. Pretty sure you can guess what the trade is. In an industry that has a shortage of skilled labor this sounds like a great idea. It seems most these guys do NOT want to go back to prison and want to learn a trade and feel like they are making a contribution.

There are other stories in here too including one by everyone's favorite CNC WEST columnist (OK he is our only columnist) Tim Paul. Thanks for reading and wishing you all a GREAT 2018.

Sincerely

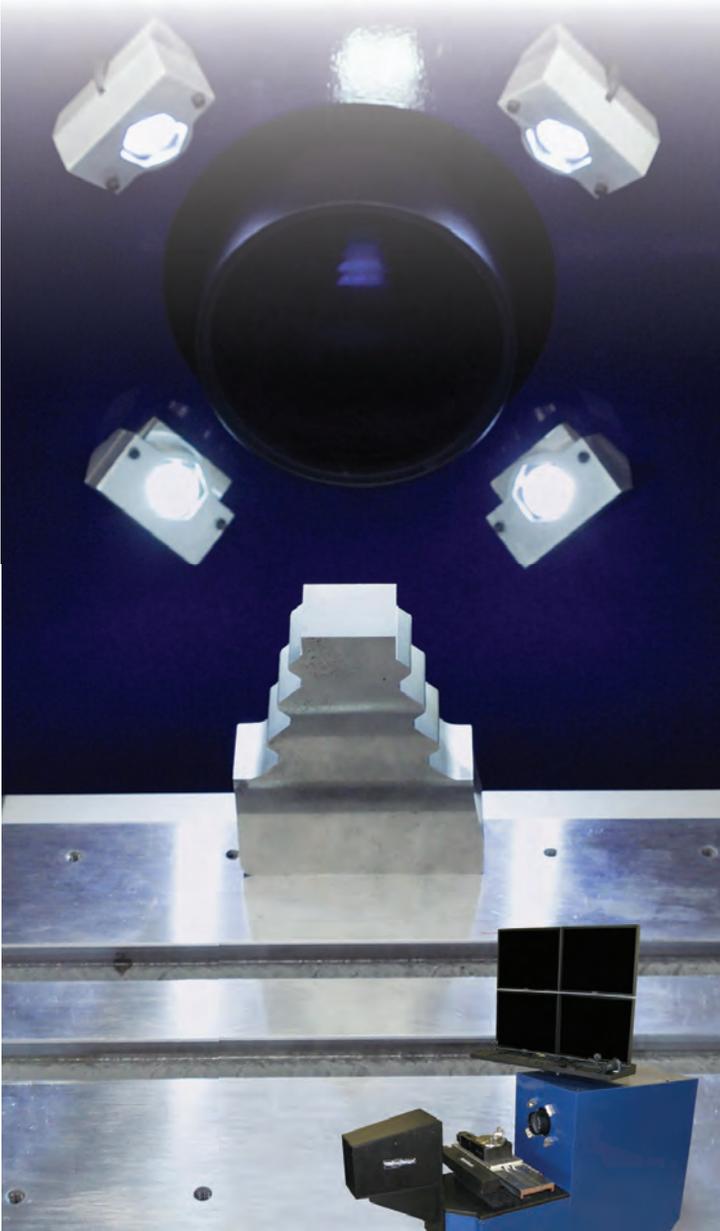
Shawn Arnold

Shawn Arnold, Publisher



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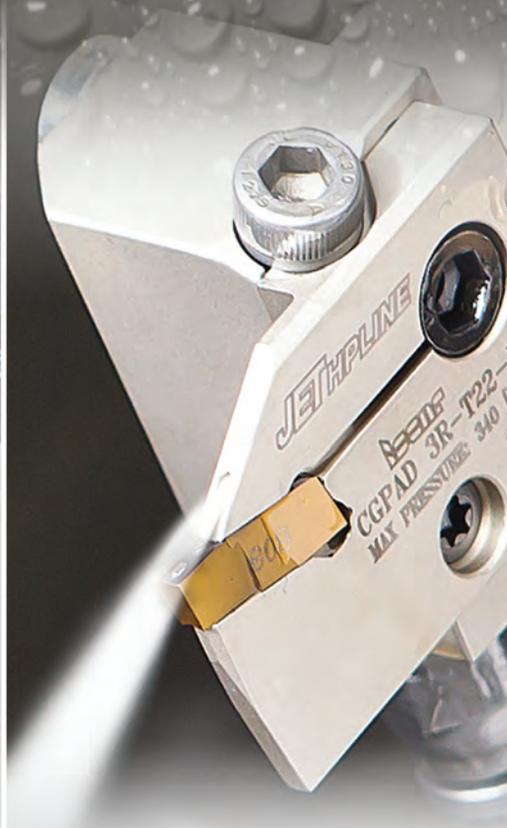


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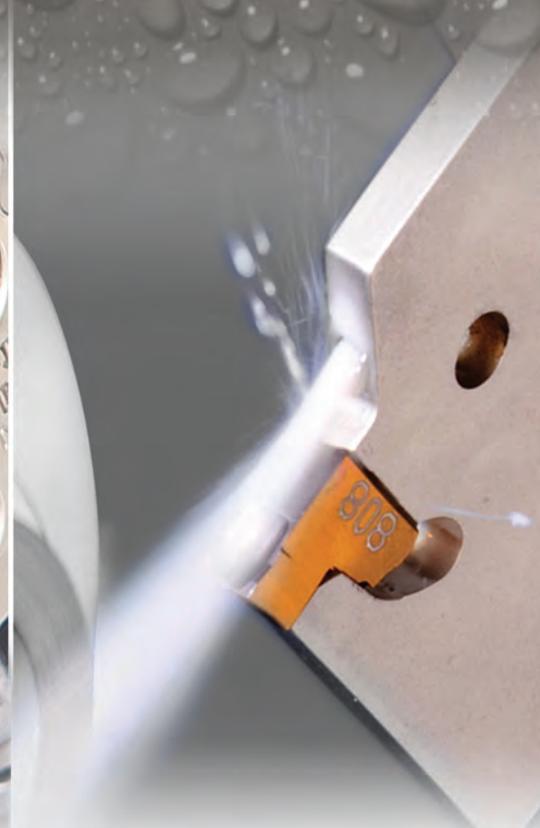
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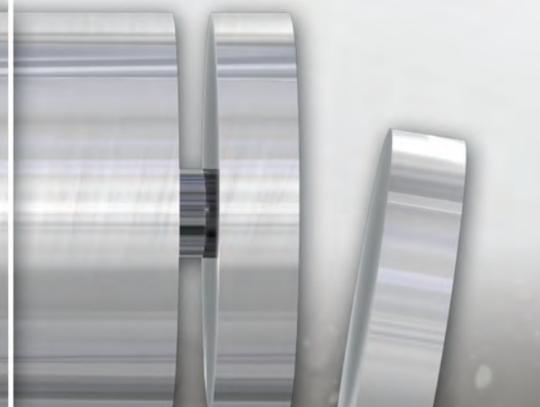
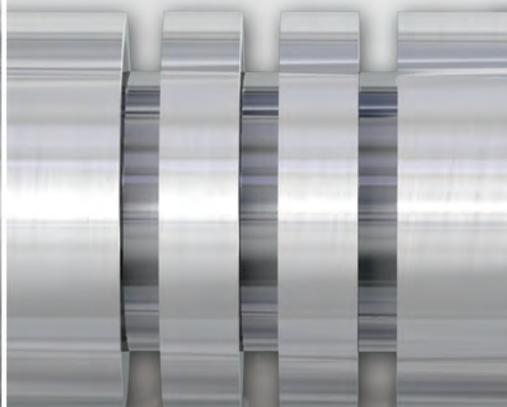
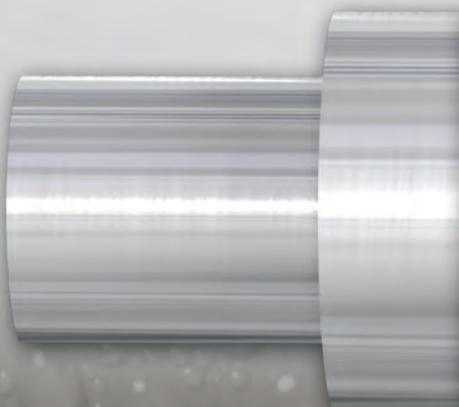
Turning



Grooving



Parting



EXEC HOTLINE

Boeing, Avolon Finalize Deal for 75 737 MAX Airplanes

Boeing and Avolon, the international aircraft leasing company, on November 19 finalized an order for 75 737 MAX airplanes. The confirmed order is for 55 MAX 8s and 20 MAX 10s, with options for 20 additional MAX 8s.

The agreement, announced as a memorandum of understanding at the 2017 Paris Air Show, is valued at nearly \$11 billion at list prices including the 75 firm and 20 option aircraft.

General Atomics Gets \$8.9M U.S. Missile Defense Agency Contract

The U.S. Missile Defense Agency awarded General Atomics Electromagnetic Systems Group an \$8.9 million contract covering phase 1 of its Low Power Laser Demonstrator.

Under the deal, General Atomics will "perform the next step for the [demonstrator] effort that addresses laser power and aperture size by integrating and testing a low-power laser on an unmanned aerial vehicle." The agency is using a Predator B aircraft from General Atomics Aeronautical Systems Inc. Work will be performed in San Diego and Poway, and continue through July 31.

GA Acquires Assets of Colorado-based Co. Specializing in Small Satellites

General Atomics has acquired the majority of the assets of Englewood, Colorado-based Surrey Satellite Technology US LLC, a company specializing in the design, manufacture, launch and operation of small satellites.

The San Diego business made the announcement Nov. 13. Financial terms of the deal were not disclosed. GA said it plans to integrate the business into its Electromagnetic Systems Group, whose products include railguns and electromagnetic aircraft catapults for aircraft carriers.

Surrey provides innovative small satellite technologies, systems and services. It was established in 2008 as a subsidiary of Sur-

rey Satellite Technology Ltd. of the United Kingdom.

Boeing Predicts that Middle East Will be Big Buyer in Years to Come

Boeing said Middle East airlines will need 3,350 new aircraft over the next 20 years valued at \$730 billion.

The bullish forecast for the region, released at the Dubai Air Show, projects 5.6% annual passenger traffic growth for Middle East airlines over the next two decades. Boeing Commercial Airplanes VP-marketing Randy Tinseth pointed out that 85% of the world's population lives "within an eight-hour flight" of the Gulf.

Twin-aisle aircraft will make up nearly 50% of the new aircraft delivered to the Middle East over the forecast period. These aircraft will comprise 70% of the value of commercial aircraft received by Middle East carriers (\$520 billion), Boeing said. "Both percentages are significantly higher than the global average," the manufacturer noted.

"The region will need 1,770 single-aisle airplanes valued at \$190 billion, driven by the growth of low-cost carriers," Boeing said.

U.S. Army Gives GA-ASI a \$462.1M Contract for Servicing Drone

San Diego area General Atomics Aeronautical Systems Inc. received a \$462.1 million contract modification from the U.S. Army for a year's worth of services for the Army's Gray Eagle unmanned aircraft.

The deal covers maintenance and repair support for Gray Eagle aircraft in the field.

In a statement in October, GA-ASI said it has delivered 165 model MQ-1C Gray Eagle aircraft to its Army customer. The unmanned aircraft can stay aloft for 25 hours and carry Hellfire missiles.

Work will be performed in Poway, CA. and will last through Oct. 23, 2018.

Continued on page 88.....

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						Part Number	Set Price	Part Number	Set Price
Kit B206 HS06	6"	0.472	10MM	0.787	2"	KT-6200F	\$ 32.73	RKT-6200A	\$ 76.18
					4"	KT-6400F	\$ 91.15	RKT-6400A	\$ 115.42
Kit B208 HS08	8"	0.551	12MM	0.984	2"	KT-8200F	\$ 42.85	RKT-8200A	\$ 89.55
					4"	KT-8400F	\$ 72.88	RKT-8400A	\$ 159.00
Kit B210 HS10, N210	10"	0.630	12MM	1.181	2"	KT-10200F	\$ 47.85	RKT-10200A	\$ 132.47
					4"	KT-10400F	\$ 78.57	RKT-10400A	\$ 213.26
Kit B12 HS12	12"	0.709	14MM	1.181	2"	KT-12200F	\$ 68.57	RKT-12200A	\$ 179.33
					3"	KT-12300F	\$102.82	RKT-12300A	\$ 270.67
Kit B212 N212	12"	0.827	16MM	1.181	2"	KT-12208F	\$ 68.57	RKT-12208A	\$ 179.33
					3"	KT-12308F	\$102.82	RKT-12308A	\$ 270.45

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10"	2.99	3500	BI-3866-1000P	\$1,244.32	\$1,119.89
12"	4.06	2800	BI-3866-1200P	\$1,597.82	\$1,438.04
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B208, HS08	8"	KT-80HJ2-U	\$301.91	KT-80HJ2-X	\$312.71
B210, HS10	10"	KT-100HJ2-U	\$354.24	KT-100HJ2-X	\$370.44
B-12	12"	KT-120HJ2-U	\$399.22	KT-120HJ2-X	\$415.42
B-212, HS12	12"	KT-128HJ2-U	\$400.09	KT-128HJ2-X	\$416.29
B-15	15"	KT-150HJ2-U	\$538.65	KT-150HJ2-X	\$554.85



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HAAS CAT40	5/8-11	.589	45°	No	C40-4501S	\$ 16.88
Fadal CAT40	5/8-11	.740	45°	No	C40-4500S	\$ 14.48
Okuma CAT40	5/8-11	.589	60°	No	C40-6000S	\$ 16.88
Mazak CAT40	5/8-11	.740	45°	Yes	C40-4500H	\$ 15.00
Mori Seiki CAT50	1-8	.905	90°	No	C50-9000S	\$ 20.81

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Platino Fiber Evo Laser Technology-Prima Power

Prima Power presents the new version of Platino Fiber, one of the top products of the Turin company. The 2D laser cutting machine, based on a more than consolidated platform with more than 2000 installations worldwide, has been upgraded with important technological innovations. Platino Fiber Evo is equipped with fiber laser sources (with 2, 3, 4, and 6 kW power) that provide high performance and reliability.

One of the major innovations introduced is a new head for fiber laser cutting, which ensures significant benefits for the customer in terms of machine reliability, increased performance for reduced piercing times and increased cutting speeds (especially on high thickness). Also the Platino Fiber Evo cabins are new, they increase the machine accessibility, reduce its overall dimensions and are easy to install. This version also features a new generation control: "Open", produced by Prima Electro, it allows easy and complete management of the work programming and machine parameters.

Platino Fiber Evo has been developed to maximize the customers' competitiveness according to their application. In fact, the machine is provided with different packages of options dedicated to the various production needs: Smart Cut, Max Cut and Night Cut.

The main innovation concerns the technological hub of laser machines: the cutting head. Platino Fiber Evo is equipped with the new cutting head with adaptive collimator designed and manufactured by Prima Power: it is a fiber laser cutting head with adaptive optics for automatic management of the focus position and focus radius diameter. Thanks to a quick, reactive and precise stand-off measurement, the new head is designed for excellent quality and dynamic cutting on all materials, but also for using maximum cutting pressures (certified mechanical structure) and resisting the most demanding environments (totally sealed structure). In line with Prima Power's tradition, process reliability still provides important benefits thanks to the SIPS (Safe Impact Protection System), the lens case equipped with OPC (Optical Precision Control) quick alignment system and protection window case for easy inspection.

The head is equipped with a single focus lens, suitable for all production needs. The protection window is integrated into a dedicated case for easier inspection. Thanks to the automatic adjustment of the focal position and the beam diameter can be excellent cutting flexibility of various thicknesses without manual intervention by the operator, ensuring maximum productivity.

The OPC (Optical Precision Control) can diagnose any differences between the real position and the theoretical position of the focusing beam and show them on the graphical user interface of the control system. Two knobs located at

the front of the cutting head can be used to perform corrections that may be needed to center the lens in virtually no time.

A capacitive sensor keeps the distance between the nozzle and the sheet constant. The system is also equipped with a nozzle calibration and cleaning kit. After executing a predetermined number of holes or machined parts, the machine will automatically clean the nozzles and perform the sensor calibration cycle.

Another important new feature relates to the two new cabins available for Platino Fiber Evo, Lean and Open, which have been successfully introduced on the Laser Genius, another Prima Power 2D laser cutting machine. The Lean cabin is the best solution in terms of compactness, cost and easy installation. With the Open cabin it is possible to exploit the good accessibility offered the cantilever structure of the machine. This cabin allows front, lateral and roof opening. The two lateral sliding doors, which can be completely opened, ensure excellent accessibility for the operator and allow easy loading and unloading of 1500x3000 mm format sheets in any configuration, including automation.

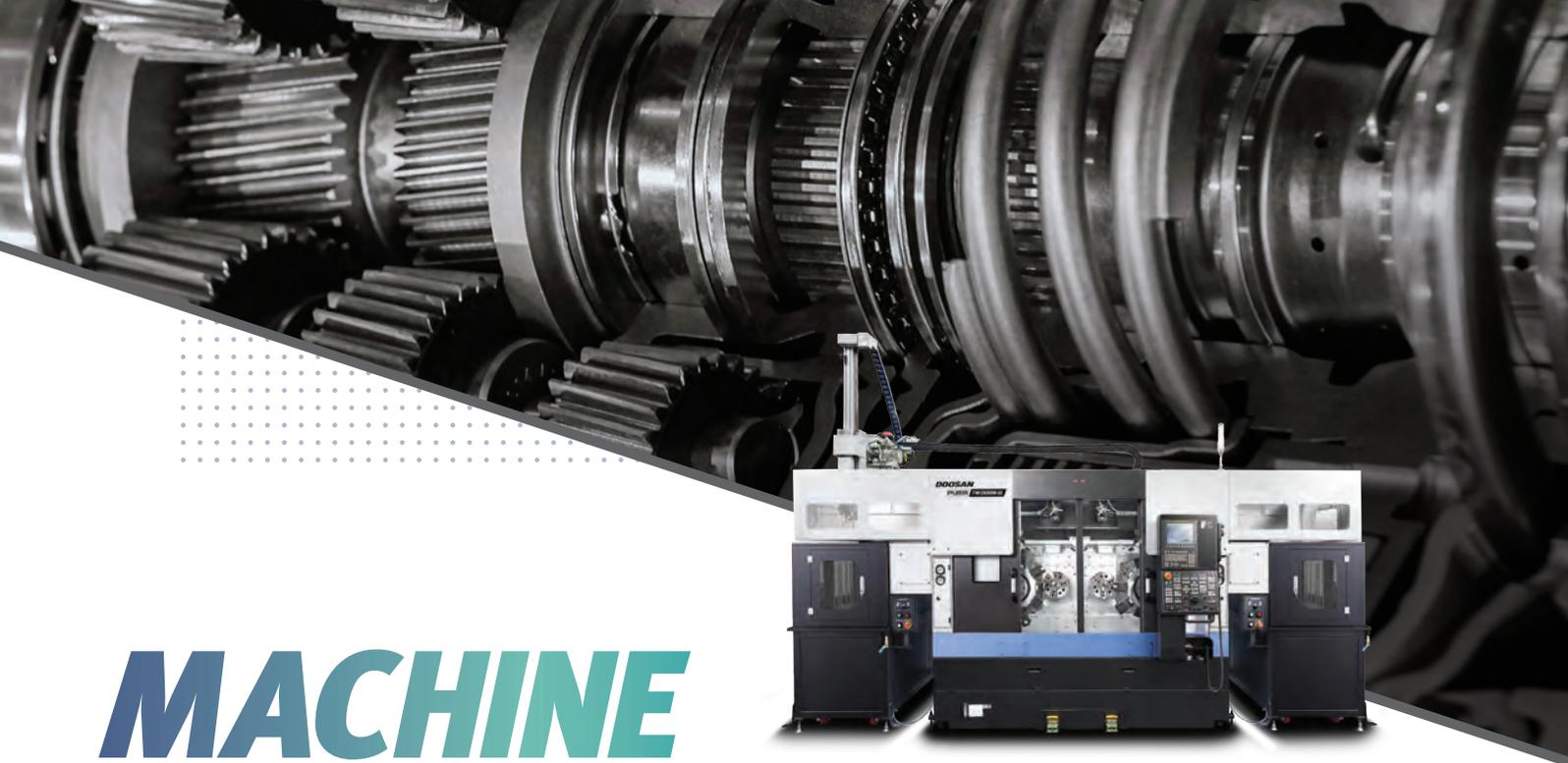
Platino Fiber Evo features a latest generation numeric control designed and manufactured by Prima Electro. It represents the intelligent and easy-to-use motor of Prima Power machines and provides the basic information to manage and monitor production. Its main functions include laser parameters monitoring and management, work programs editing, and programming management with a complete preview function, also available in real-time.

The Smart Cut options suite is an ideal solution for fast processing of thin sheet metal (up to 6 mm thick) for which the nitrogen cutting technology can be used: a result obtained through technological solutions such as Smart Moves or Grid Cutting, which allow to reduce unproductive times such as the head positioning times.

To maximize productivity on parts made of medium and high thickness sheets (6 to 25 mm), the Max Cut options package was created.

Prima Power has developed the Night Cut options package, which maximizes productivity and provides better process monitoring. This is made possible by devices that control the machining process status and intervene in case of errors restarting the operation or informing the operator remotely; the LPM (Laser Piercing Monitor) controls the piercing operations; Plasma and TipTouch Restart monitor the cut: the email Dispatching prompts the operator in case of problems.

Like all models produced by Prima Power, also Platino Fiber Evo is Industry 4.0 inside. Industry 4.0 is in fact a new title for concepts that are already being applied in Prima Power for a long time.



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Article & Photos by Sean Buur

QUALITY IS NUMBER ONE AT FUTEK

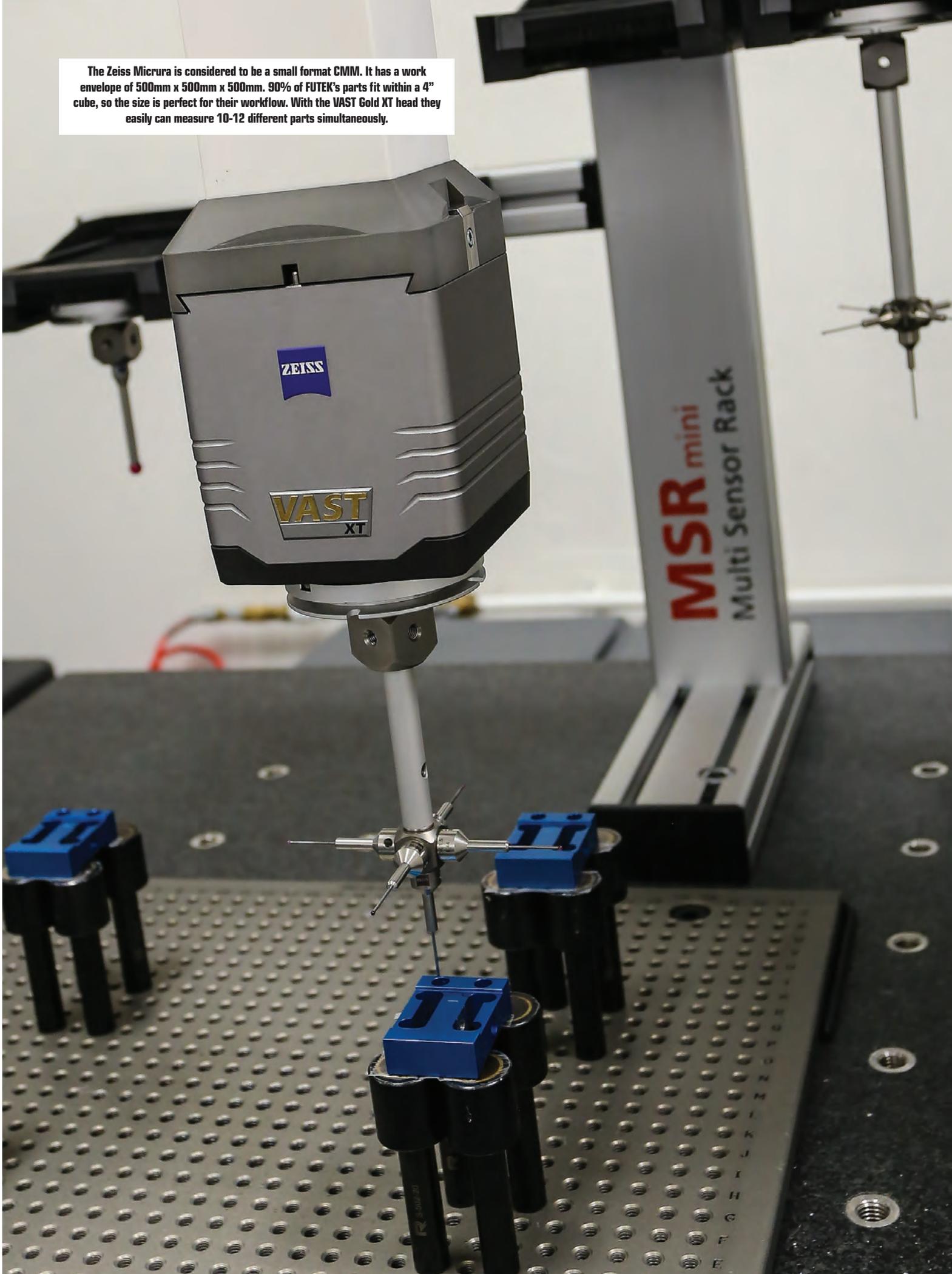
For more than three decades, So-Cal based FUTEK Advanced Sensor Technology, Inc. has committed to making the highest quality sensors available in the test and measurement industry. As an ISO 9001, ISO 13485, and ISO 17025 certified facility, quality can be mission critical. FUTEK relies on their state of the art quality lab to ensure they meet the stringent demands of their customers.

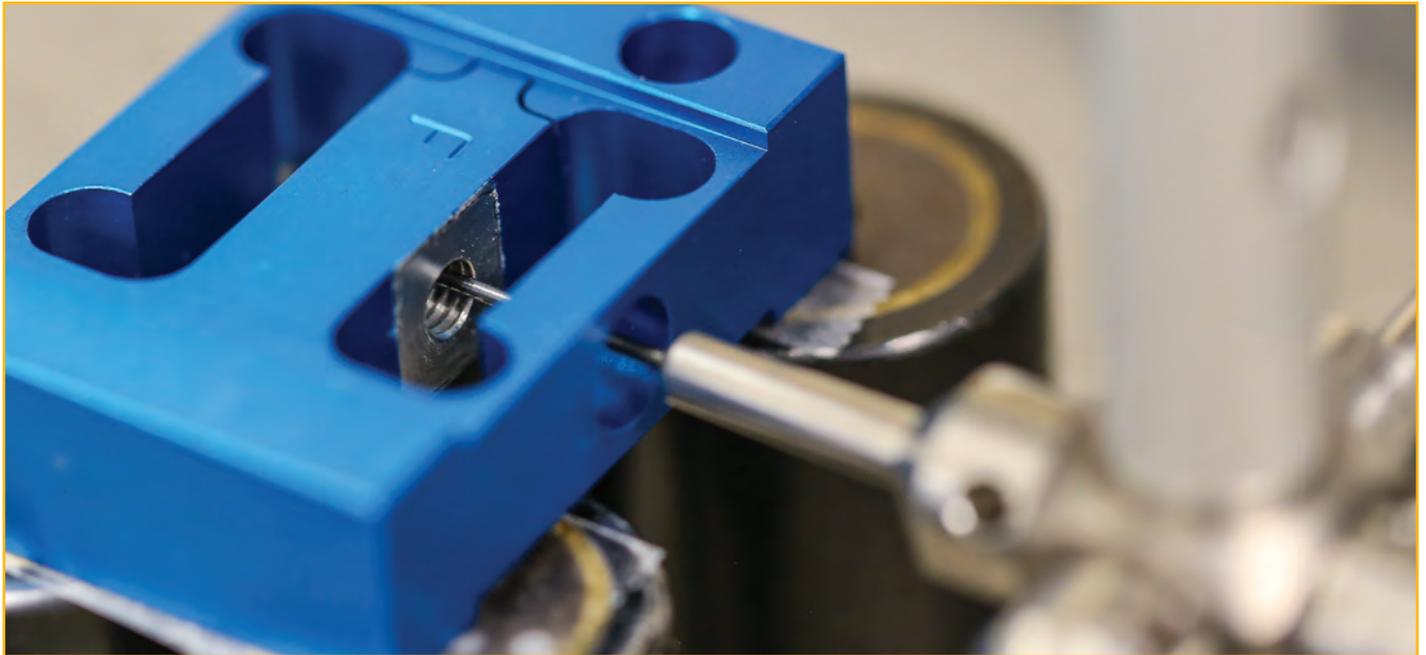
FUTEK designs and manufactures sensors for industry. Every industry you can think of is probably using their sensors, but their recent focus has been in medical and aerospace. "A lot of our efforts are targeted towards high growth industries like aerospace and medical," tells Thomas Bowles, Director of Quality Assurance. "They both offer challenges like no other, but miniaturization and redundancy are a common theme." FUTEK prides themselves on being part of groundbreaking technology with their sensors on the da Vinci surgical robot, autoclavable sensors and the Mars rover Curiosity. "We have two sensors on the Mars rover," explains Thomas. "It continues to send back

amazing science from the surface of Mars. We cheered right along with mission control as it landed. It is incredible to be a small part of endeavors like that. For every one of those projects, there are thousands of seemingly less exciting applications for our sensors. Anything you need to weigh from bags of potato chips or bags of blood to torque and force on an oil-drilling rig. Chances are that our sensors are doing those jobs."

FUTEK manufactures made in the USA sensors from standard to niche applications. Their small sensors can measure from milligrams up to 200 lbs, while the larger ones can measure 1 million pounds. "We sell a lot of the large capacity sensors," explains Thomas. "Heavy industry uses them on cranes and outriggers to insure everything stays in balance. NASA used eight of them on the vehicle transporter that moved the space shuttle from the vertical assembly building out to Kennedy Space Center's pad 39a. They didn't want it to tip over, so our sensors made sure it remained level." Each industry has its own set of challenges and FUTEK has the most inhospitable

The Zeiss Micrura is considered to be a small format CMM. It has a work envelope of 500mm x 500mm x 500mm. 90% of FUTEK's parts fit within a 4" cube, so the size is perfect for their workflow. With the VAST Gold XT head they easily can measure 10-12 different parts simultaneously.





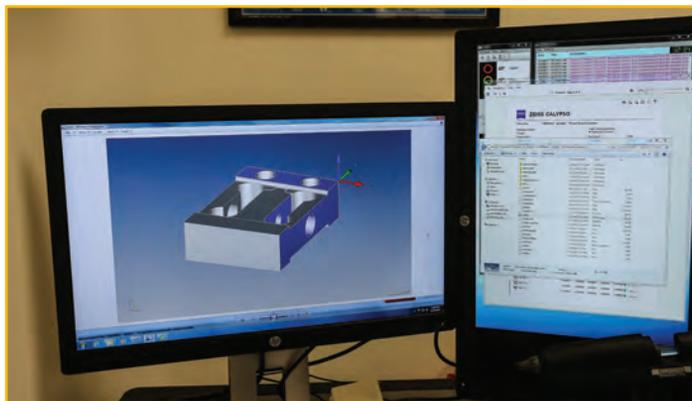
FUTEK has a high mixture and variety of parts. The Zeiss Micura and Calypso software eat up the work through intelligent measurement and self-optimization.

conditions covered. They manufacture sensors capable of withstanding temperatures of 500°F down to -310°F and up to 1,500 psi pressure. “Newer sensors for medical and dental require the ability to be reused over and over,” details Thomas. “No one wants to throw away these expensive instruments, so they use a form of sterilization like an autoclave. Our sensors are designed to withstand multiple sterilizations. At the other end of the spectrum the Mars rover sensors are cryogenic and need to cope with extreme cold on the planet’s surface. The cold side of Mars is as cold as -243°F so JPL spec’d out a sensor that could survive down to -310°F. Quality is number one on everything we do regardless of the application.”

Thomas has a Master’s Degree in Engineering with a minor in Math. This former LAPD police officer and commercial pilot has spent the last 15 years building up FUTEK’s quality lab. “I’ve been in quality and manufacturing for more than 30 years,” tells Thomas. “Before coming to FUTEK, I worked for a company that did ultraviolet disinfection and sterilization. I hold a patent in HVAC sterilization and worked at Magnavox Advanced Systems building the first GPS receivers.” Maria SanFilippo is

FUTEK’s Quality Manager and handles all day-to-day operations in QA. FUTEK pays a lot of attention to their suppliers, and Thomas takes care of the training and qualifying all their vendors. Unless there is a question with the supply chain he stays out of the trenches and lets the QA team of five do what they do best. Both he and Maria are Certified Quality Engineers and Certified Quality Auditors by the ASQ (American Society for Quality). As experts in their field it comes as no surprise the amount of research that went into purchasing a new CMM for the quality lab.

Up until two years ago, FUTEK was using an all manual CMM in their quality assurance laboratory. Their experience with the manual CMM was that it made good measurements, but was slow. As business grew, it was becoming difficult to keep up with production. “We were not keeping up with the advancement in the sensors at the same rate using a manual machine,” explains Thomas. “It didn’t record data, so we had to transcribe the readings manually from the control panel to our inspection sheets. There is no typical drawing, but say on average for a mechanical machined part there are 25 features to check.” They wanted to take the operator variable out of the mix and automatically record all the measurements they were taking. It became very apparent that they needed a better way of doing things. All of FUTEK’s parts are individually serial numbered and inspected. As soon as the part begins its journey through production, the Oracle ERP system assigns it a serial number. In January 2015 FUTEK assigned serial number 500,000, quite the milestone for the company. “Our inspections are done to AS9100 and AS9102 inspection for first articles,” tells Thomas. “All the details of that part are recorded and kept forever. Everything from the dimension and tolerance, to who made the measurement and what equipment was used to make the measurement is stored in a part’s genealogy. We have a high mixture of parts, so for example, we have more than 300 different size thread gauges. 0-80 to 6”x8 and most sizes in between. We have to track everything for the genealogy, so automation



Calypso’s reporting format matches FUTEK’s AS9102 so they use it exclusively to get a complete genealogy of the part. All parts have a unique serial number that the Oracle system assigns when it enters production.

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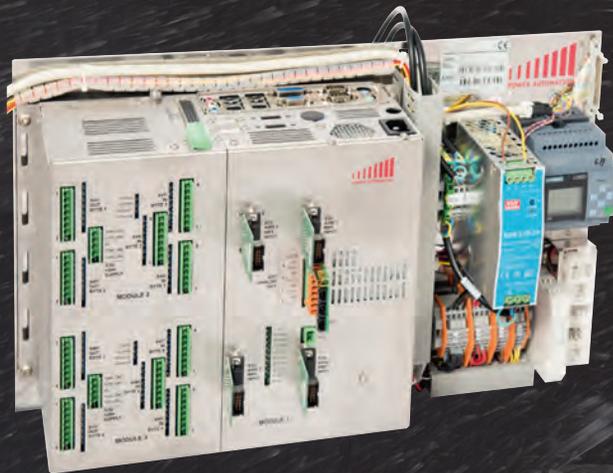


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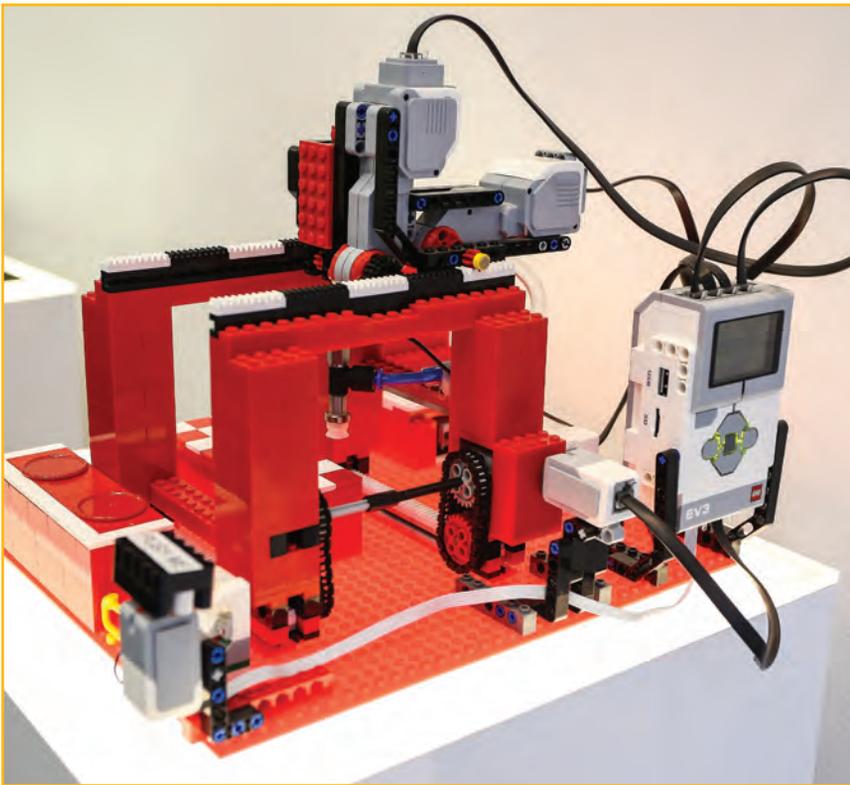
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Left - For exhibitions FUTEK has working models made of LEGOs that utilize a variety of sensor combinations. Top right – LSB205 Miniature S-Beam Jr. Load Cell. Bottom right – LCB500 Tension and Compression Load Cell.

was the only option. We surveyed the market, looked at every machine that was available to us, and decided on the Zeiss Micura.”

The Zeiss Micura is a small format CMM machine with a 500mm x 500mm x 500mm measuring envelope, but the majority of FUTEK’s parts fit within a 4” cube. “Ninety percent of what we manufacture fits the machine perfectly,” details Thomas. “What doesn’t fit we send out for measuring. The Zeiss Technical Center is in Irvine and is literally a few blocks away from our corporate headquarters and based on their reputation, we were very interested in their products. We were able to take parts down and measure them on a machine like the one we were planning on purchasing. We buy the majority of our inspection instruments through Pacific Inspection in Irvine. They are a dealer for Zeiss and a wonderful company to work with before, during and after the sale. Especially, their after-sales-support. After seeing the capabilities of the Zeiss Micura firsthand, we knew it was the machine for us. It has been on our floor for almost two years, and we are still tickled pink with it.”

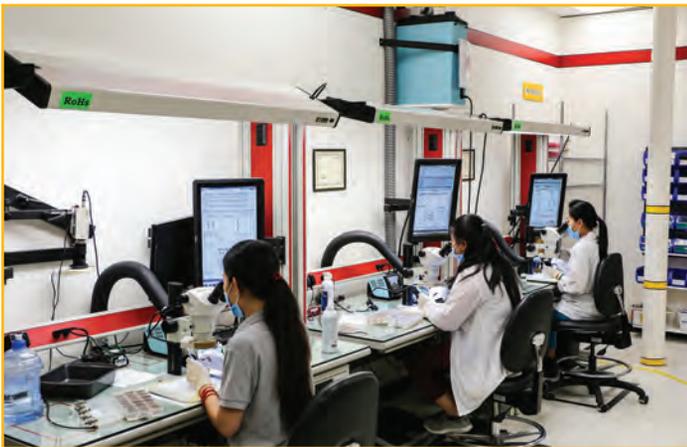
Thomas has found the Zeiss training to be extraordinary, breaking up the instruction you need on the Calypso software into more than two blocks. “Their training is next level,” touts Thomas. “Prior to the Zeiss training our inspectors had no automated experience with a CMM. Everything we’ve learned came from the Zeiss.” Everyone goes through the basic one-week course working on the same machine that you purchased. Zeiss won’t offer the advanced training until trainees go out and use the machine in real-world applications. They even assign measuring homework to do between courses. “Zeiss also offers advanced courses on features that not everyone buys,” continues Thomas. “Such things as reverse engineering and specialty

probes. We have a lot of probes. They are pretty standard, but do go down as small as 0.3 mm styli as well as one disk probe. Our VAST XT Gold sensor head enables high-speed scanning. It can take individual points, or it will scan the entire surface taking hundreds or thousands of points. You get a much better picture of the surface and eliminate any outliers. Scanning is a big deal and is the first step to reverse engineering.” FUTEK’s five-styli star probes allow them to inspect all sides of a part, even underneath it, without the need to refixture. You can even measure tilted on angles. The Zeiss Calypso software makes great use of the VAST XT Gold sensor that even has adjustable touch force for different measuring surfaces. “We’ve found the Calypso software to be very intelligent,” adds Maria. “You set up the routine and tell it to measure. It will take the most efficient path along the surface, and completes each step in the most efficient order. You tell it what you need measured and it self-optimizes. It knows the number of points to take for GD&T.” The reporting format matches their AS9102, so they use it exclusively to get a complete genealogy of the part. “The fact that it reports and stores the data automatically, even into our SPC program is something we couldn’t do on a manual machine,” continues Maria. “You can place ten or twelve parts within the work envelope, and it will measure and record all of them.”

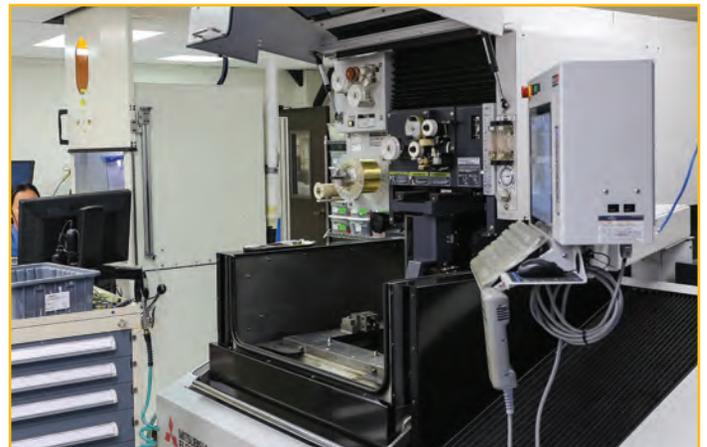
A major feature that FUTEK appreciates is the ability to program offline. They have one seat of remote programming, and as soon as the engineering design is complete, the AutoCAD file is ready to download. The inspection routine is programmed offline and then loaded over to the Micura once the actual part is ready for inspection. “We have 90% of the program ready to go before the part is even machined,” details Maria. “We are set when it comes in for first article. On the old machine we would



FUTEK's machine shop is filled with Okumas. They have 4-axis milling and multi-spindle turning. They run two shifts and still require outside vendors keep up with demand.



Micro soldering is one processed that requires the work be done in-house. Step by step instructions are tied to the part via monitors along with the part's genealogy.



Most of the special processes have been brought in-house like EDM, laser welding, laser marking and grinding.

have to start programming a new routine when the part came for first article. That takes a lot of time, and the CNC machine would sit idle while we figured out the best and most efficient way to check the part." The offline programming has also sped up the process for outside vendors in the supply chain. "We work very closely with our vendors so when they send us or bring us a first article part we are ready to go. It is doubly beneficial to them. It saves time on first article, and is measured by the same machine that will check every one of their production parts. Usually, you are at the mercy of whatever machine they have. Some have manual CMM machines, but none have the level of our Zeiss Micura. We have eliminated the possible issue of their measurements showing different results than ours."

FUTEK validates the Zeiss Micura every morning. ISO 10012 recommends that you calibrate instruments every day or validate the accuracy, so there is no more than one day's worth of parts at risk. If you find it to be out of calibration, then you have to go back to the last time it was calibrated. Every part in between is suspect. With daily verification every part measured is still in-house and can be remeasured if necessary. "We've been very pleased with the Zeiss Micura even though

it doesn't match the spec in their literature," jokes Thomas. "Zeiss's specifications guarantee that it would be accurate to .7 micron +L/400. We are not getting anywhere near that. We're getting .2 micron, and it's not dependent on the length of the part. We're talking across all 500mm of measurement at .2 micron. Even Zeiss is impressed with that performance. Pacific Inspection has even used our machine to demonstrate GR&R to prospective customers. We take great care of it and it takes great care of us."

All of FUTEK's parts are not just designed, engineered and made in the USA. They are made right here in Irvine, California. "Everything we do is here," concludes Thomas. "We've been in the community for 30 years, and most of our vendors are local too. All the mission-critical work like micro soldering, wiring, lamination and calibrating are all done in-house. Most of the special processes have been brought in-house as well. We do our own milling, turning, laser marking, laser welding, grinding, and EDM. We don't do any anodizing or heat-treating, but everything else is done onsite. When you buy FUTEK know that we take great pride in what we do and where it is made."

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Josh Ogle of Ogle Watch Co.

OGLE WATCHES

TOXIC PERFECTION IS A CHARACTER ASSET

Los Angeles watch maker Josh Ogle knows his strengths and his weaknesses. Depending on the day, pride can be considered either or both. Over the last 25 years Josh has started a company out of resentment, sold beach cruisers to gain humility, and shot commercial photography by chance. For most that would be enough, but as they say time waits for no man, and for Ogle Watch Company, that time is now.

While studying to be a graphic designer in Boston, Josh ran across an article about custom bicycle frames in a magazine. Having the summer off he contacted the builder to see if he needed any seasonal help. He was willing to do whatever necessary to help out around his shop and hopefully get some money off the price of a new bike. "I called him up all excited," tells Josh Ogle, president of Ogle Watch Co. "But instead of being thrilled

at the idea, he was kind of a jerk about it. Telling me I was going to open up shop for myself and steal his ideas and that he would never show anyone anything. Being a professional frame builder was literally the farthest thing from my mind at that time. But I copped a resentment after that phone call and got to thinking." Inspiration came later that year when Josh was in Oregon visiting his engineer uncle for Thanksgiving. "My uncle is a brilliant and amazing guy," describes Josh. "For fun he rebuilds 17th century telescopes. He was working on this really complex orrery from at least a hundred years ago when I got there, just for fun. That week we built a bike stem in his workshop. I hadn't made anything out of metal since like fifth grade, but I had a solid aptitude for it right away. I was hooked. So I moved to Oregon, struggled through building a few frames on my own, and then took a couple classes in titanium frame building and



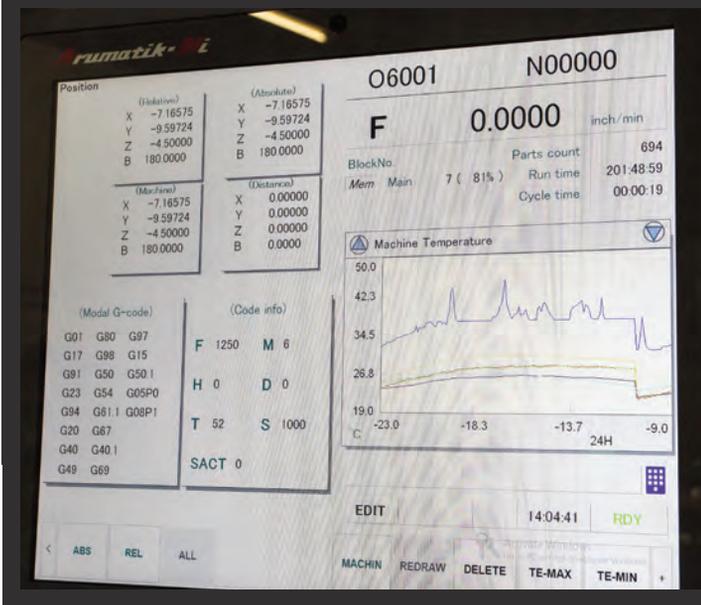
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Top- Josh is a self taught programmer. He took a basic turning class in Junior College and learned conversational on his retrofit Bridgeport mill. The rest of it he has just picked up and researched. “There is a big community of people out there that are willing to share their knowledge with you,” explains Josh. “There are a lot of individual people out there that don’t have the resources of a big shop, but together we have a great collective of information. It has paid off wonderfully. I never forgot the rudeness of the bike manufacturer when I was younger. I don’t want to be that guy. I go on forums and share what I can with those willing to learn. So many people have done the same for me that paying it forward is rewarding. I look at it as we all get smarter together. If we share information everyone makes a better product be it a bike or a watch or a Mercedes supercharger, lol.” Left - The Kitamura is equipped with a touch screen controller. The machine and the controller are filled with intuitive features. One that Josh cited as being incredibly useful is the thermal compensation. In a non air-conditioned shop this is especially helpful in the hot summers of So-Cal.

started a career making custom bikes. At that point I loved the process so much I had forgotten about that builder in Colorado.” As a graphic arts student he always had an eye for design, but little did he know his medium would come in metal. His designs evolved once he moved from Eugene to Northern California bay area and saw that you could add CNC capabilities to a Bridgeport mill.

A light switched on for him and he bought a Bridgeport mill with an Anilam retrofit CNC controller. “I was able to elevate my designs with these trick CNC machined parts,” explains Josh. “My bikes became more unique, interesting and different. I got really good at it, and gained some notoriety. Along the way I found the limits for the retrofit machine and lucked into an incredible deal on an almost new Kitamura 3Xi. A real

CNC with way more capabilities than my skills could utilize at that point.” Life events and that notoriety caused a reevaluation of priorities and he dropped what he was doing and moved to Los Angeles for a change. “I decided humility was a better goal than notoriety and ended up selling cheap beach cruisers at a local bike shop,” laughs Josh. “My mother asked me to try taking some studio-style photos of some knit hats she was selling. A publicist saw what I did and soon I was shooting commercial photography for a living.” His proclivity for dangerous toys led him from bikes to cars and once again he tapped into an unknown talent and parlayed that into another career change. “I got big into high performance European sports cars,” describes Josh. “One day I was at this custom tuner shop and they were complaining that their fab guy just quit in the middle of a project. I explained to them that I was pretty good at fab work and talked myself into this job. They were skeptical that a guy who built bikes could work on cars and gave me a 1 month trial period.” Two weeks in he was hired full-time. He began to design

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Styli and Training Part



Installation and
Training Required

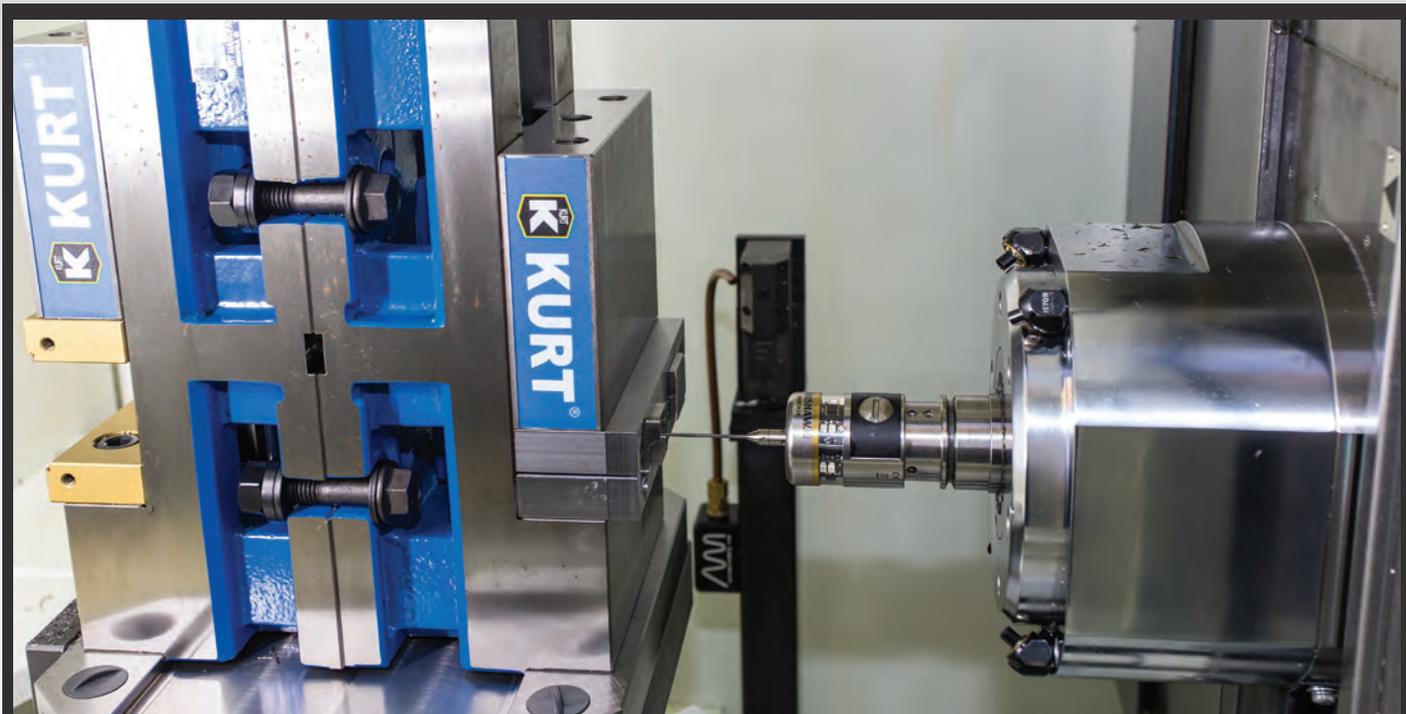
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Josh added the Renishaw OMP400 probing system to his new Kitamura. He finds it invaluable on the watch parts because of size variance. Thickness on these tiny parts can vary by .004" on a .020" thick part. So with the Z axis probe he is getting no variance. With a .004" cosmetic chamfer or .007" pocketing there is no room for error. His only current non watch job is based off of casting and he has to probe every one before machining. He was doing it by hand before and it would take 5 minutes each. Now it is literally 30 seconds. Also on the machine is a BLUM laser system for tool measurement.

and engineer parts while bouncing from shop to shop. Eventually he landed back where he started, heading up their design and performance department. "I had finally brought my CNC mill down from storage in the Bay Area and was getting really proficient with it when the company I worked for went bankrupt," details Josh. "So, I began my freelance career as a CNC job shop. I was doing standard fun job shop work, auto, bike, fitness equipment, random parts for a variety of industries. I got to the point where it was easy. Then watches came along and it stopped being easy real quick."

Josh enrolled in a weeklong "beginning" watch making seminar in the mecca of time, Switzerland. He was the only one in the class without years of watch making experience. "They looked at me like some nutty mechanic who was arrogant enough to think he could build watches," explains Josh. "The instructor didn't even want to let me stay in the class. I convinced him to give me a shot and that if I didn't keep up to kick me out. No harm, no foul. It was iffy at times whether or not he was going to let me stay. In the end he made a joke and presented me with my certificate of completion. It was at that point that I knew I had the confidence to become a watch maker." Josh's first watch attempts were admittedly not great. The design was lackluster and the producibility was way off what it needed to be. "There are things that look right and things that don't," details Josh. "The watch industry is interesting because there are watch designs that are outrageous and people love it because of that. Then there are traditional watches the people love because they are traditional. There is a weird dead zone in the middle and I was right there for a long time." Not bold enough, and not traditional enough, Josh reevaluated his design and went bold with the help his CNC.

His first dedicated CNC machining center was a 2001 Kitamura 3xi. He loved it. It was bullet proof, but he found with tiny

titanium watch parts that the 10,000 rpm spindle on an older machine just didn't perform as well as he wanted. "I'd become a huge fan of the Kitamura brand with my 3xi," describes Josh. "It was an amazing machine when it was new and served me well for many years. When I decided it was time to step up my game there was no doubt that a new Kitamura was in my future. I made the mistake of trying to save a little money purchasing a different brand machine. I was sold on it being perfect for what I needed, but in the end it was more of a jewelry machine and not something that could handle the grade 5 Titanium." Lesson learned, Josh contacted Machinery Sales Company for information on the latest Kitamura machining technology. He was reluctant to give up the size of his 3xi vertical but was really impressed with Kitamura's MYCENTER HX250iG horizontal machining center. "The HX250iG has a much smaller work envelope than my previous machine, but since I've transitioned over to near exclusivity on watch parts it hasn't been an issue," explains Josh. "It was installed back in April and I learned the hard way what great after the sale support you get from Machinery Sales Company and Kitamura." Josh is on his second spindle after a "slight" error on his part sent the first one full speed into a titanium part. "It was my fault and I didn't feed them any BS. They came right out and I was up and running again in no time. I hadn't completely destroyed the spindle, but it wasn't running straight any more, and for the tiny parts I'm making, any runout isn't acceptable. The impact would have killed a lesser machine completely."

Josh was drawn to the MYCENTER HX250iG for a number of reasons. His first priority was the 30,000-rpm spindle and the second was the size. "I love that they cram so much machine in such a small footprint," touts Josh. "It is a four axis mill with 50 tools and actually delivers what I need when it comes to surface finish. The rigidity, especially for its size is amazing." Being able

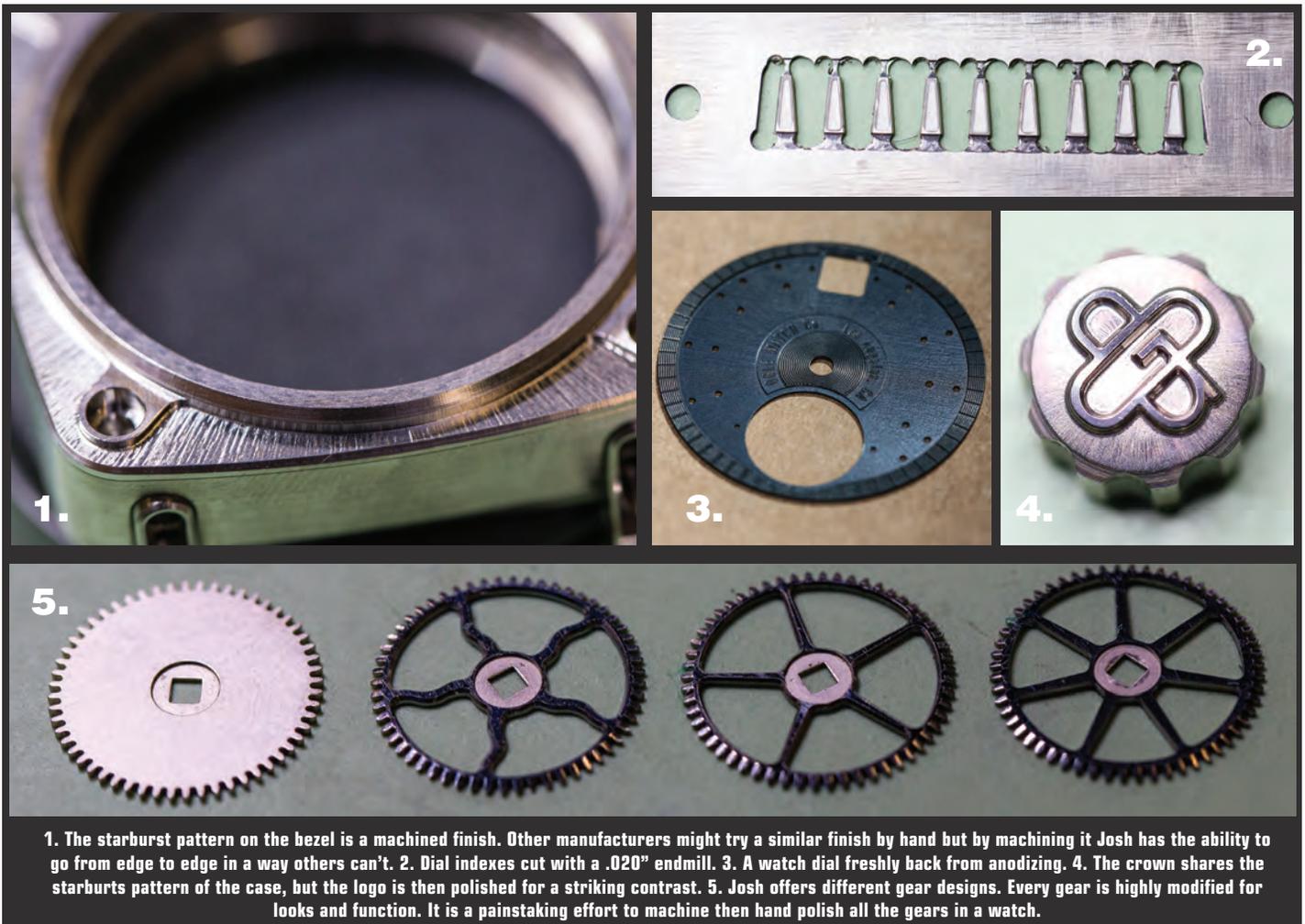
to push the really small tools in titanium is great for Josh. He uses a lot of 1/64th" cutters and notches tiny little pockets. He went to shrink fit tooling and run out is less than a micron. He tries to hold tolerances on the watch parts around half a tenth. Everything has to be accurate and stay accurate.

Since getting the machine he has become a huge fan of the pallet system. Everything is loaded at one time and he can spit out an entire case assembly in two starts. He explains how "Every case part I make lives on the pallets. Literally I load material and go." Josh manufactures everything on the watch but the crystal, the second hand, and some smaller parts in the movement. "A watch has a movement has four main plates," details Josh. "I designed my own plates to replace the original generic versions. They're 100% made in the USA on the Kitamura." Josh had highly customized the movements he was using, but by watch purist standards it can't be considered his own. "It is a painstaking process, but sets apart what I'm doing compared to others who use the same base." Josh is of the philosophy why make a watch that looks like every other watch, acts like every other watch, but has your name on it? Two seconds with him and you know he wants to be different, dares even to stand out of the crowd.

Ogle's Watches appeal to the hard-core watch nerds who want a legitimate American made watch. Not an Apple Watch, not a fashion watch, but a hand crafted timepiece. "Little flashes of light catch your eye as you move the watch," touts Josh.

"Those details take hours and hours of time." Polishing a single gear can take him 25-30 minutes. Horology is still an art form even when you automate some of the processes with CNC. Ogle's Watches are large, and people notice them right away, but so many of the details are subtle and not immediately obvious. Josh loves that the more you look, the more you see, and the more apparent it becomes that someone loves what they do and really cared about producing an exquisite product. Josh only produced eight of the Founders Edition watches this year and has his sights set for 20 watches in 2018. Making a ton of watches is not in the cards. Low volume exclusivity is an aspect of Ogle's Watches that aficionados crave.

"Funny, this is the first interview I've done regarding my watches," Josh says with a chuckle. "I've been putting off talking with watch industry people because I'm not sure I'm where I want to be yet, but CNC West Magazine... That's cool! I'm totally in for chatting about CNC and how much I love my Kitamura. I was really excited to have you guys come see what I do." All the same attributes he strives for in his machining he sees in the Kitamura. "It is such a well made machine and the quality is evident," concludes Josh "Aki Kitamura puts his name on every machine and he is proud of that. He recognizes his family's legacy and it is reflected in the Kitamura machines." As someone who is putting his name on a product too, Josh respects and appreciates that. Ogle Watch Co. might not be as well known as Kitamura, but they are well on the way.



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RISE UP INDUSTRIES



Michael, John, Nicholas, George, Darren, Angel, Daniel, Dustin and Joe

JOB SHOP IS CHANGING LIVES THROUGH SOCIAL ENTERPRISE

Santee, California based Rise Up Industries Inc. is not your typical job shop. They have 3000' sq.ft. of manufacturing with Haas mills, Haas lathes, and a staff of about 8 people. They service a variety of industries, but the reality is they are doing you, me, and society a greater service. Their mission is to minimize gang involvement by providing integrated gang prevention and supply post-detention reentry services. A key component of their reentry program is full time employment and 18 months of on the job training in their CNC equipped machine shop.

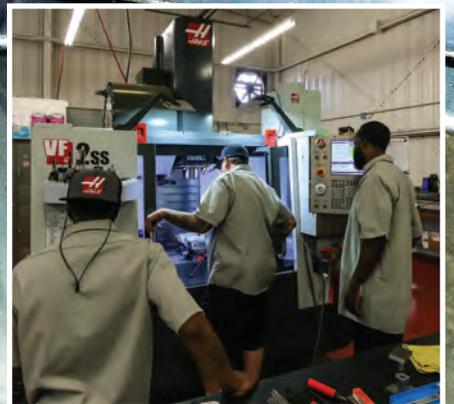
Joe Gilbreath is the director/founder of Rise Up Industries Inc. He was working with Kairos prison ministries when a book was brought to his attention. "One of the books that was making the rounds was Tattoos on the Heart: The Power of Boundless Compassion," tells Joe. "It is by Jesuit priest Father Greg Boyle, the founder of Homeboy Industries in Los Angeles. I was moved by reading it, and went to see him speak at one of the local prisons. I chatted with a few inmates who were getting ready to be released and asked them what they were going to do. They were clueless as to what was out there available to them. When we were walking back to our cars I asked Father Boyle if Homeboy Industries was only in Los Angeles. He explained that it was, but that 25 other non-profits in the US have used Homeboy as a model for their own 503(c)." That got Joe thinking, and after researching it he found that there were no similar programs operating in San Diego County. Homeboy Industries is recognized as one of the most effective gang preven-

tion programs in the country. Homeboy Industries has social enterprises where they employ members in jobs that support their programs. They have Homeboy Bakery, Homegirl Café, Homeboy Salsa, Homeboy silk screening, and the list goes on and on.

Rise Up Industries incorporated in 2013 and it took a full year before getting their 501(c)3 status. Joe had met an inmate who was training fellow inmates in a vocational CNC program for 14 years. He turned his life around in prison, got paroled, and was released four years ago after serving 25 years of a life sentence. Joe picked him up two weeks after he got out and took him down to a job interview at a local manufacturing facility. "The company specialized in welding equipment and industrial products," tells Joe. "I didn't know it at the time, but they had a few CNC machining centers as well. This guy was terrified going into the interview. He did the interview and they gave him a shop tour. Sitting on the shop floor was the same Haas machine he had been training people on for years. That was a touchstone for him, and he hit it off with the guys in the department. Well they hired him, and he now heads up the one of the manufacturing sectors. Our initial idea was to do silk screening and coffee for our first two enterprises. He inspired us that a machine shop might be a great option. We began researching CNC and saw that being a CNC machinist was a well-respected, high paying job. We also learned that the industry was in desperate need of qualified applicants to help fill the skills gap they are experiencing. We got connected to Haas and they entrusted us



Darren Stotts is Rise Up Industry's #2 on the shop floor. He and Dustin do all of the programming and training. Here he is showing Michel and George how they need to load the part in the Chick Wokholding Solutions One-Loc vise. Rise Up Industries is a working job shop so quality is important. Teaching good work habits and attention to detail is as important as teaching how to machine. They purchased the One-Loc at the same time as their new Haas machine. Since then they have added a few more smaller One-Loc vises to the other machining centers.





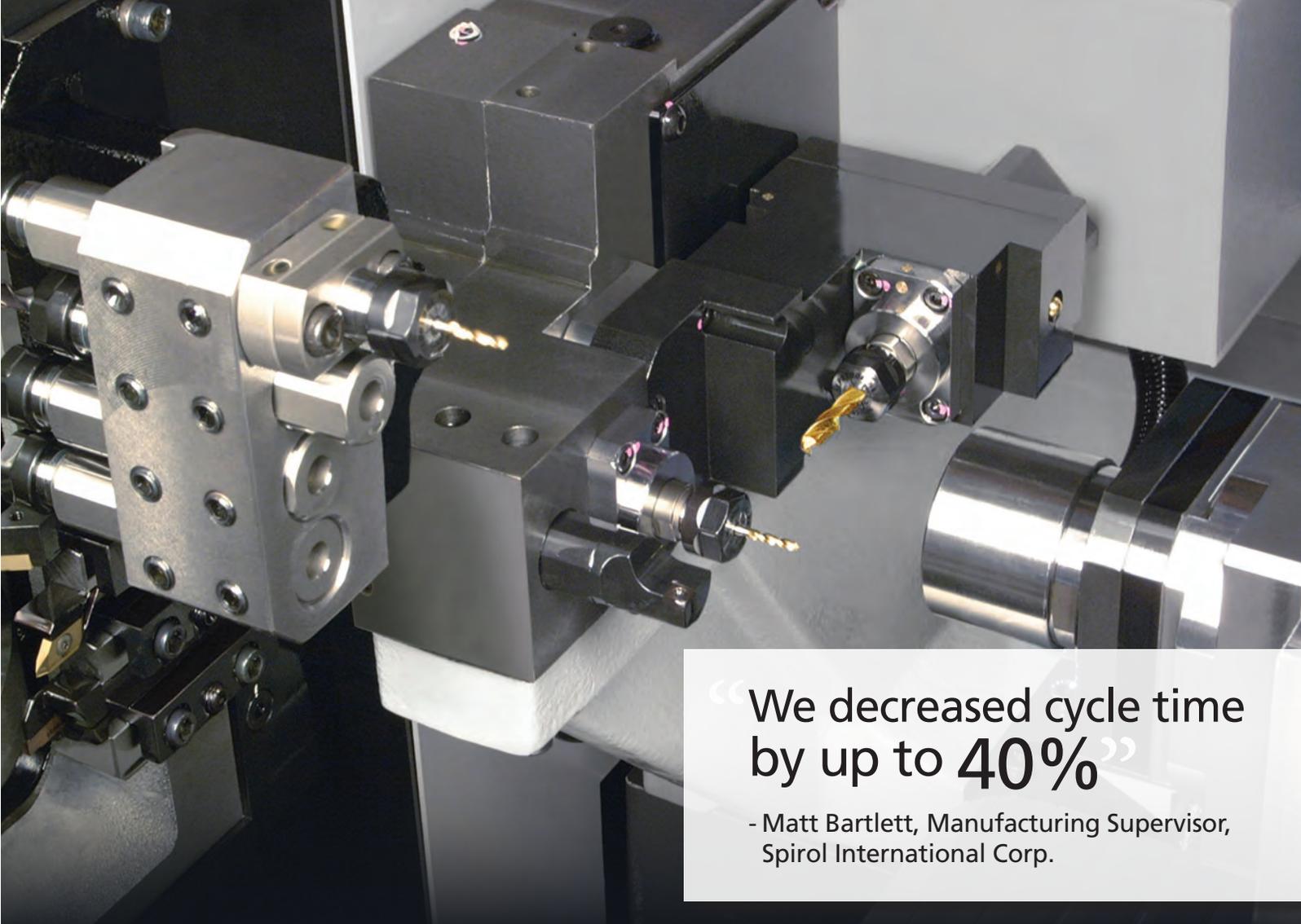
Daniel and case manager Marvin Winters go over banking details before Daniel's graduation. Case managers assist members wherever needed to ease the reentry confusion.

Daniel - "I've been out little over two years. I did 2, 4, 6 years at State,prisons, but graduated to federal prison. DEA cracked me and I went away for 16 of my 18 year sentence. I didn't plan on working here at Rise Up, I actually planned on going back to selling dope when I got out. But once I got out everything had changed, even drug dealing. I wasn't equipped to even sell drugs any more. Cell phones are now computer and cross walks talk to you. There is this app called Google Earth that can see you from the sky. I was afraid all this stuff was going to get me caught. I met Dustin and Joe and they told me about this program. They had just started it. I was so excited. No one had ever asked me to start anything before. I'd never seen these kind of machines before in my life. I didn't know anything about it. Now as I graduate I can do programming. I can tell the machine to make this part and it does. That is insane to think about from two years ago. I like it, I really like it. I have never liked anything before in my life like this. I'd done so many bad things that I wanted to do some good, do something that was good. I've never finished anything and here I am the first graduating student. I've never been first at anything either. My new wife and baby are a great inspiration to me. He just turned one and they are my foundation. I am so happy to be a part of this program. I've already got a job starting at \$16 an hour with 2 weeks paid vacation, monthly bonuses, health and dental and even a matching 401(k). I didn't know what it was, but everyone else was excited for me so I knew it was a good thing to have. I told myself I am going to start this program, I'm going to finish it, and I'm going to see it grow. Everyone makes mistakes. I made huge mistakes, but now I'm out, making amends and want to live a normal life like everyone else. Rise Up Industries has helped me to achieve more than I thought I deserved. Best part of the program is watching how it has grown and to be a part of that."

with our first piece of CNC equipment (a TMP1) at no charge for two years." Rise Up Industries machine shop started in 500 feet of garage space near the airport. They had no clue about CNC. "We could barely spell CNC," jokes Joe. "But we knew enough to hire people who could do the job we wanted. So, we placed an ad in the paper for a shop manager / trainer for the formerly incarcerated."

Dustin Greeves first saw the ad in December of 2015. As a 25-year veteran of mold making he was looking for a change, but wasn't sure training ex-cons was the job for him. After seeing the ad again he looked up Joe and downloaded Tattoos on the Heart. "I listened to the first chapter and knew exactly what they were trying to accomplish," tells Dustin, shop manager at Rise Up Industries Inc. "I interviewed and got the job. My first day the Haas machine was delivered to the garage. I was paranoid that it wasn't going to fit. In February 2016, we were ready to roll and hired our first member soon after. It has been quite the journey so far." Members are paid minimum wage and receive 18 months of CNC training partnered with other useful

reentry tools like life skills, work ethics, spiritual guidance, case management services and counseling. Members work full time, 40 hours a week with the flexibility necessary for people who just got released from long term prison sentences. Dustin based the curriculum on his decades of industry experience. "I know what employers are looking for in a new employee," explains Dustin. "So, the training is based off what Darren and I know from our combined 50 years in manufacturing. Members get work experience on mills and lathes, plus math, blueprint reading, and some CAD. We are a working, full service, job shop with milling and turning. Any job that comes through the door is part of the curriculum. We do actual jobs, for actual customers." Angel ran a manual lathe in prison back in the 80's but he is the only member who had ever seen machining equipment. "The members come here with no idea what CNC is," tells Dustin. "These guys have been locked up for decades and don't have any computer training. Computer is the first C in CNC, so they are starting from scratch." Dustin and his #2 Darren Stotts are building the program on the fly. As a job shop they never



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SCAN THE CODE FOR ADDITIONAL DETAILS





Nicholas - "I served 24 years of a 32 to life sentence. I've been a member since August 14th, 2017. I learned about Rise Up while in prison. It sounded good, and when I got out my friend Angel told me about it again. I've known Angel since 2000. I'm getting familiar with the machines loading and unloading. Basic operations to go along with book work. I didn't know what CNC was, but Angel told me how it could be a career. I'd done construction before so have worked with tools, but nothing like this. I like the computer aspect of the training. I had some computer experience in prison through my various jobs. No internet access, but we worked off of flash drives. Hardest part of transitioning out of prison for me is transportation. It is hard to get a car with no credit. My credit score is up to 624 so I'm on my way, but it is still hard. San Diego Credit Union gave me a secured loan and a secured credit card. I didn't know about raising my credit score, but the people here at Rise Up helped me through the process at the credit union. I like it here because they understand the requirements of just being released. They are flexible as we get our lives in order. Some employers don't want to have you meet with your PO at work, but here it is encouraged. We have mentors that volunteer to help us out. With the staff and other members it is a supportive environment. We get paid and get trained. You have to change to get here. The parole board is really keen on your in prison job experience. They pay a lot of attention to your work ethic. They know if you won't work in prison you would not work when you get out. I wasn't preparing for the parole board, I was preparing for getting out. By working hard inside it became habit, so when we get released the anger management, and conflict resolution are second nature. When you have a lengthy period of criminality then you need to have a lengthy period of improved lifestyle choices. Readers of CNC West should really come check out Rise Up's training program. I hope people read this and realize how we are hard working and how excited we are about being a part of manufacturing and not just a bunch of ex thugs."



Angel - "I was sentenced as a juvenile and did 41 years in prison. Got caught up living a life as a gang member. 27 years into my sentence I knew I wanted to change. It was the only way I would ever see my family again. I got out 8 months ago and have been a member here at Rise Up for almost six months now. I'm about to start the second phase of training. I'm learning a life skill to be able to support myself and my family. Ross Provenzano came to the prison and did a talk about Rise Up. Showed us photos and explained to us what the program entailed. I wrote a letter to Joe about the possibility of getting on the list when I got a parole date. I got out February 10th and every day is a better day than the last. Better than I could have dreamed of. The biggest obstacle for me since getting out is managing my money. I went in as a kid. I never had to pay a bill before. I don't have the computer skills that Nick has so this phone drives me crazy. I have to be dragged out of Target because there are so many things I've never seen before. I'm like a kid again. I was so callous in prison, now I'm grateful for everything. This job, sunshine, it's all great for me. To be out and to be part of the program is awesome. I like working out of books and reading all the information. I've been working mostly on the lathe lately and the mill is a little intimidating to me. I worked in the prison machine shop in the early 80's but it was just a manual lathe. I did graphic arts, blueprints, auto repair and wood working inside. I hope to become a journeyman machinist and move closer to my family up in Tulare. I'm happy with the simple things like driving a car and deciding where I want to go. Freedom is amazing and the support I get from members and staff at Rise Up is invaluable."

know what they get, but Rise Up is beginning to get repeat business and is the manufacturing partner on a new to market product. "Trent, the inmate Joe spoke of earlier invented a product," details Dustin. "He invented fire hydrant valve to prevent failing fire hydrants from doing hundreds of thousands of dollars in damage."

Since its inception Rise Up Industries had the vision of a 3000 sq.ft. shop with five machining centers, running two shifts for a total of 12 members. Members are staggered throughout Rise Up's three-phase program. Each block of training is six months long: entry level, experience level and pure mentor. The goal is for members in the mentor stage to be able to help the newest members just starting out. Teaching someone to do something is the best way to learn and get better at it yourself. Their budget goal was \$470,000, but through individual donations and private foundations they raised \$490,000 in no time. "Thanks to generous donors we were able to expand into our new shop pretty quickly," elaborates Joe. "Were able to add members, buy more machines, increase training materials and move into a larger building. Money is great, but what we really need now is partners in the community to hire our graduates."

Rise Up Industries is looking for exposure on a multitude of fronts. First and foremost, they are in need of shops and manufacturers to believe in the program to help place graduates. "Companies who read CNC West Magazine are in a position to offer assistance in a lot of ways," describes Joe. "Maybe you are not sure of wanting to hire an ex- inmate, but want to support our efforts. Buy coffee from us; send us your next shirt order. Better yet of course would be to have these guys come interview for positions. I think potential employers will be surprised by how hard these guys work, and their dedication to learning. I encourage any of the readers who might be on the fence about hiring from within our program to come down, meet the guys, and see the operation in person. We have a weekly e-mail newsletter that they can sign up for as well. That list is growing as more people and companies hear about us."

"We take the people that have made the decision to change their lives," continues Dustin. "We are in a position to help them continue down that path with a career in manufacturing." It took their member Angel Ramirez 27 years of incarceration before he turned his life around in prison enough to be considered for parole. It was another 14 years before he got released. People think you can just fake your way through a parole hearing, but members explained that

isn't the case. "The parole board sees through all the BS," tells member Nicholas Fox. "It isn't easy to get a parole date. You really have to change your ways inside before you even can think about seeing the outside." It is a common misconception that the vast majority of released prisoners go right back to jail within three years. That statistic is true except when it comes to lifers. Research shows that less than 5% of lifers end up back in jail in the same three-year period. They have more to lose. If they mess up, they are never getting out again, and will die in jail. Rise Up Industries recruits from that pool of released prisoners. Daniel Magueflor is the first graduate of Rise Up Industries' CNC machining course. He served 16 years in federal prison before being released two years ago and becoming a member. Daniel finished the program in November and came out of it with a new career at a local San Diego manufacturer. "They hired me at \$16 an hour starting," brags Daniel. "I have benefits, bonuses, paid vacation, and a career for the first time in my life. I'm thrilled, my family is thrilled, I'm so excited to get a second chance at having a real life."

"It's so awesome that Brian Harrigan from Chick Workholding Solutions gave you our information," praises Dustin. "We knew nothing about Chick vises until it was recommended to us on the last machine we purchased. We love the One-Loc vises now. Brian is a great guy, and we are humbled that he thought enough of us to make introductions. Industry connections are just what we need. It is important to us to have a good reputation. I tell these guys the trade will give you back everything that you give it. It might not be overnight, but one thing these guys have is patience. You tell them it will be a few years before it really pays off for them and they embrace that. They did hard time, success is an easy sentence to look forward to." It is estimated that 1000 prisoners with life sentences will be released in San Diego County next year alone. They are being released either way; helping to facilitate them into a useful member of society is in everyone's best interest. Rise Up Industries already has a waiting list for their machining program. "I hate to see anyone on the waiting list," tells Joe. "One or a hundred it doesn't matter. I feel badly that I can't help them all. Workers are members. It is about belonging and a sense of family. The number one cited reason kids join gangs is so they have a place to belong. So, our students go from being gang members to Rise Up members and most importantly members of society. One person on the waiting list is too many."

Most people can't relate at all to being in prison for 20 years. They don't know anyone who has served any kind of hard time. It is difficult without direct exposure to feel empathy. It is understandable that you question the unknown. These guys did their crime and did their time. They are not looking for a hand-out, but that doesn't mean that they don't need a hand up. The world changes constantly, missing 16, 24 or even 41 years would be a shock to anyone. "They train me as much as I train them," concludes Dustin. "You listen to these guys and your problems are not that bad. Their life experiences are pretty phenomenal. I go home every night feeling good about my lot in life. I'm making a difference in the lives of people who really need it. It is very inspiring, and not everyone gets that from their job."



John Villa is one of the newest members. He has been in the program only a few months but is gaining confidence on both the mills and the Haas lathe. Dustin says, "He is very dedicated to the program and his lifestyle change."

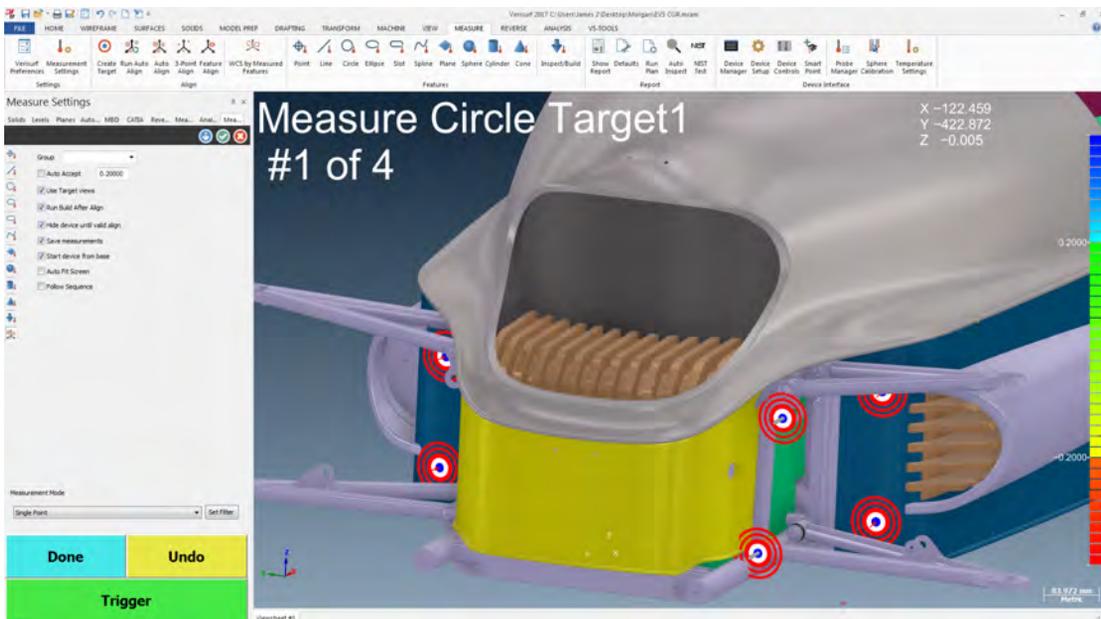


George Lating is the youngest of the members at Rise Up Industries. He has been in the training program for six months now. Members work on actual customer jobs. Rise Up's program is 18 months, 40 hours a week, full time on the job training.



Michael Hune is in phase one of his training. He joined the team at Rise Up Industries four months ago. He works on one of the newest machining centers, a Haas VF2. "Michael is quickly becoming one our leaders here at RUI," tells Dustin.

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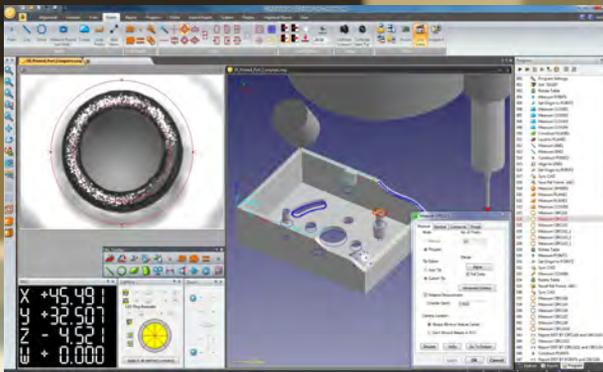
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In the abrasives market, right angle grinders have traditionally been used in conjunction with grinding wheels, fiber discs, wire brushes, and flap discs. When non-woven abrasive products entered the field, the technology replaced traditional coated abrasives as a faster and more cost effective method of stripping, deburring, blending, prepping, and finishing.

Non-woven abrasives have three basic components: synthetic fiber web, abrasives, and resin. The density of the web and the size and type of the abrasive used, provides an array of combinations that give non-woven right angle grinding products not only a great deal of versatility but also unique attributes not available in other abrasive products.

Stripping wheels are recognizable by their very coarse, open web construction. They are ideal for stripping paint and coatings, without affecting the base metal. The open structure resists loading, enabling it to strip even the gummiest of substances like seam sealer and adhesives.

Prepping wheels have a more open fiber weave. This may be familiar to most users as it was the original structure of most non-woven products. It is an excellent product for surface preparation, cleaning, and finishing. The prepping wheel is available in a depressed center wheel configuration with a fiberglass back-up pad or, when more conformability is needed, as a disc that attaches to a rubber back up pad.

Latest Non-Woven Technology

To solve users' most aggressive stock removal and blending challenges, new extra heavy-duty non-woven discs have recently come on the scene that can do stripping, prepping and finishing. The latest technology can remove scratches, splatter, discoloration, and blend surfaces in a single step. Users will significantly save labor and consumable costs by reducing application steps as compared to conventional grinding and blending methods.

For example, Saint-Gobain Abrasives has recently introduced Norton Rapid Prep™ XHD Coarse and Medium discs. The Coarse range is ideal for surface blending on steels, while the Medium range works well on softer metals and alloys. The new Norton Rapid Prep™ XHD discs offer a unique combination of a conformable fiber matrix and premium ceramic grain, resulting in improved cut control and surface blending over traditional coated flap and fiber discs. Product life is increased, and shape integrity is maximized due to the Norton blended fiber web which dissipates workpiece debris. In addition, the Norton Clean Bond® resin system prevents smearing and produces a controlled wear rate.

Excellent Test Results

Norton Rapid Prep XHD test results have been exceptional. In comparison tests, fabricators and welders will see a 26% higher cut rate, with less shedding, and twice the life over competitive products using the new Norton non-woven discs. Norton Rapid Prep XHD discs are ideal for working with stainless steel and aluminum.

Here are three Norton Rapid Prep XHD application examples:

1. Application: Light weld blending and finishing of firetruck ladders

Material: Aluminum

Machine: 7" Cleco model # 9173M (1.6hp) rated at 12,000 rpm

Competitive Product: Coarse 7" Surface Conditioning disc

SGA Product: Norton Rapid Prep XHD Coarse 7" Hook & Loop disc

Results: Norton Rapid Prep XHD Coarse disc - 26% faster cut rate and 2X life vs. popular non-woven disc

Operators at this company have been using competitive non-woven discs for many years. The primary operator has been doing this job since 1988 and is very open about how products work. He was impressed from the very start with the Norton Rapid Prep XHD discs. It did not wear down as fast as the competitive disc and both operators commented about Norton disc not leaving smear marks on the part as the disc wears away. The Norton disc also held up better to edge grinding and full contact.

2. Application: Spot weld grinding and surface finishing of IT network cabinets

Material: Carbon Steel

Machine: Dynabrade® air grinder model number 50821 rated @ 11,000 rpm using a competitor's hard back-up pad

Competitive Product: Coarse 4-1/2" quick-change disc with TS attachment

SGA Product: Norton Rapid Prep XHD Coarse 4-1/2" quick-change disc with TS attachment

Results: Norton Rapid Prep XHD Coarse disc - 2X life vs competitor's product w/ less shed (The Norton XHD disc was able to complete 1040 square inches with no surface issues vs competitor's 480 square inches).

3. Application: Locomotive cab weld grinding and surface blending before prime

Material: Carbon Steel

Competitive Product: Two popular designed grain fiber discs and one non-woven disc

SGA Product: Norton Rapid Prep XHD Coarse 7" disc

Results: Disruptive performance observed: Norton Rapid Prep XHD can reduce a 3 product operation to a single step

- Back of cab - Norton Rapid Prep XHD disc was able to replace 3 products

- Side of cab - Norton Rapid Prep XHD disc reduces 2 steps into 1

- Front of cab - Norton Rapid Prep XHD disc shows better finish than a competitive fiber disc

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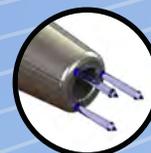


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CAD/CAM/CNC Perspective

By: Tim Paul

Customer Success Manager Fusion360 CAM

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Instagram: OneEarTim

What does it take to grow a machine shop?

Over the many years in my career, I've had many opportunities to meet quite a few business owners. From my crumb-snatcher years of watching my Dad and uncle run their fab shop to being a slave to my own lawn mowing business, The Lawn Barber, during my Jr. High years, I've always wanted to learn all the little details of what it takes to start and grow a business.

I recently caught up with my friend and Autodesk customer, Kelly Johnson, Owner of Precision Manufacturing Company. I met Kelly a few years ago as he was starting a new shop in Rancho Cordova, California. Kelly started his business a few years ago as a one man show in a small shop with one new Haas VF2SS and a new seat of HSM CAM software. Kelly has since grown into a much larger shop with four Haas machines, six employees, and two shifts. With such impressive growth, I couldn't resist investigating what Kelly has done to grow his shop.

I was thinking about interviewing Kelly for this article. Instead I decided it would be best if we just had a discussion like we would have any other day. My hope was to dig deeper into what magic tricks Kelly had that lead to his strong growth in what many would consider a very competitive market. I must admit that after a couple hours of talking to

shop, and his employees.

Business Hygiene: When I use the term "business hygiene" I think of how well a company handles the fundamentals of their business. Fundamentals such as customer interactions, business partnerships and their understanding and management of their overall business. Kelly checks all those boxes, and checks them well.

When I asked Kelly if there were any single keys to his business growth he replied, "I treat each customer like they are my only customer." It was clear that Kelly saw this point as one of the most important aspects of his continued growth. As basic and easy as that mantra sounds I think it is easily forgotten and lost as a business grows and traffic increases. When talking to Kelly about many aspects of his business I picked up on a trend. He doesn't look at his business as a vendor to his customer, but rather a partner to their success. He gave me examples of contacting his customers to discuss DFM (Design For Manufacturability) details that would save them a lot of money and other examples where he would just push forward. He understands the balance of a design change's overall value vs just making it easier for him to make parts. Kelly also gave me examples of reworking parts that were customer engineering errors, but explaining that sometimes being a good business partner is what is more important.

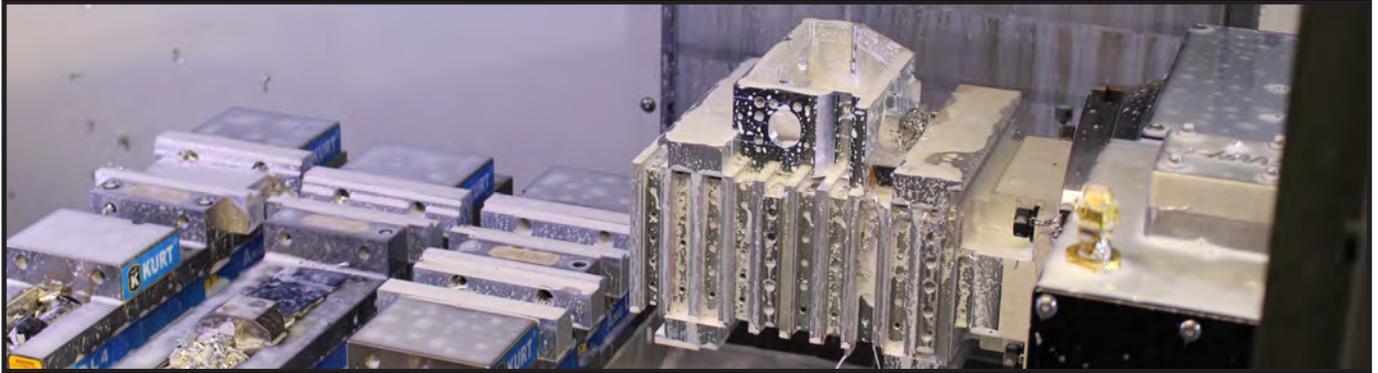
Technical: In my August/September CNC West article, I compared critical, analytical, and lateral thinking while also giving a couple examples of how they could fit into a machine shop. Managing the growth of a new machine shop is a great way to flex your thinking skills, and Kelly does a great job of thinking through challenges.

One great example of Kelly's ability to analytically think through challenges is how he has adapted and



Photos: Precision Manufacturing Company

Kelly about his business, his customers, his machines, the processes he has in place, and his career history I was a bit disappointed that I had not found the magic bullet for growing a new machine shop. It really comes down to what I probably mislabel as "good business hygiene", smart tools and processes, and lots and lots of hard work. With that minor disappointment, I was happy to find some trends, well-established principles, and a solid company mantra. In reflecting on my chat with Kelly I broke our conversation into three groups that I wanted to talk about here. Business Hygiene, the technical side of his



applied a suggestion I made about tool library management a few years ago. I told Kelly how I utilized the available 200 tools in the Haas tool offset page to more quickly set up tools when I ran a shop for L3 Communications. Kelly saw the benefits, but more importantly adapted it to best fit his shop and the type of work they do after analytically considering the different unique challenges they face. Workholding is an excellent example of Kelly's ability



to think laterally. There are many more great workholding options today than when I started in this industry 17 years ago. After analyzing his work, Kelly easily justified adding HRT210 rotaries shortly after buying his first VF2SS and added one with his second VF2SS purchase. When Kelly started looking for workholding solutions for his rotaries he found a lot of good options but none really solved all the chal-

lenges he faced in his shop. Using his lateral thinking skills, Kelly developed his own universal modular workholding system that can quickly adapt to the high mix of work that flows through his shop. I have yet to see anything like the system he developed for his workflow, and it fits what he does very well. This is a perfect example of lateral thinking.

Lastly, Kelly showed his critical thinking skills as we discussed machine tools. We were sharing our mutual desire to own a Matsuura MAM 72-35V. Kelly simply broke down the type of work he does, the cost of the machine, other machine combinations he could buy for that same amount of money, and painted a clear and unemotional decision process for how it didn't make sense for his business right now.

Employees: It is no secret that our trade has an alarming shortage of skilled workers. I asked Kelly how he could find 6 good people with the shortage our industry has. Kelly told me that while some of it is good luck with listing job openings on Craigslist, he cares more about finding good people that he can train rather than finding experienced people. He is investing in training his employees on HSM CAM software and focusing on using each individual employee's strengths. We discussed our hopes of new programs like Sierra College's CNC program feeding our industry with a strong work force. But for now, Kelly accepts that he must train workers for his shop.

I don't think it's fair to summarize anyone's business in just two pages. But, I hope Kelly's strengths showcase a few important takeaways that can be implemented in any company.

Thank you, Kelly Johnson from Precision Manufacturing Company, for sharing your business insight.
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Industry News

HEIDENHAIN's New General Catalog

From “Fundamentals and Processes” in HEIDENHAIN’s state-of-the-art development of precision measurement components to an overview of the current HEIDENHAIN-brand product program, the new general catalog from HEIDENHAIN is a solid resource of motion control product information.

Serving both OEMs and end users with equipment

measurement needs, HEIDENHAIN is well known by manufacturers of machine tools and of automated machines and systems, in particular for semiconductor and electronics manufacturing.

The new HEIDENHAIN general catalog is available online by download at www.heidenhain.com



Prima Power Laserdyne Names Operations Manager

Prima Power Laserdyne, LLC announced the promotion of Dr. Aaron Montello to the position of operations manager. In announcing the promotion, Terry L. VanderWert, president, stated that Dr. Montello will be responsible for production, manufacturing engineering, project management, purchasing, inventory control and facilities.

“Aaron Montello has served as interim operations manager for the last four months and done very well in this challenging position,” reported VanderWert. “He has earned this promotion fulfilling our practice of promoting from within our organization whenever possible.”

Montello started with Prima Power Laserdyne five years ago as a project engineer. Within three years, he was promoted to product manager.

During his tenure, he was responsible for several important development projects including Prima Power Laserdyne’s next generation Optical Focus Control and patent-pending SmartShield laser welding nozzle assembly of which he is the inventor.

Renishaw and Identify3D Collaborate to Enable Secure Digital Manufacturing

Renishaw, a world leader in metrology and additive manufacturing (AM) technologies, and Identify3D, a leader in software for the digital supply chain, announce a collaboration to offer an end-to-end, secure digital manufacturing process.

Identify3D will provide data protection coupled with contractual and manufacturing licensing from design to production on Renishaw AM systems. By choosing to secure all digital data in the engineering phase, the technology enables users of Renishaw systems to protect their digital intellectual property (IP), enforce production rules and provide traceability in the digital supply chain at the industry’s highest standard.

“Renishaw understands how important it is to have an efficient and reliable control of data flow all the way to its machines,” said Stephan Thomas, chief strategy officer at Identify3D. “We are pleased that Renishaw, has selected Identify3D as a strategic partner to provide such a solution to the market place – from design to distribution and production.”

Marc Saunders, director of global solutions Centres at Renishaw, commented, “Industrializing additive manufacturing requires that we manage and

control a complex chain of processes to deliver consistent, traceable and qualified parts. Secure transmission and controlled use of digital IP is critical to enable agile Industry 4.0 supply chains. We believe that Identify3D brings a strong and necessary solution that will increase these controls, minimising variation, to improve and protect AM production quality.”

The two companies are currently working together on pilot projects for several manufacturing customers

United Grinding North America, Inc. Opens New Miamisburg Headquarters

In just over a year after breaking ground, United Grinding North America, Inc. has officially opened



the doors of its new 110,000-square-foot headquarters. The building brings the company’s cylindrical, surface and profile grinding business units as well as its automation and rebuilding departments from its existing offices in Miamisburg, Ohio, together with the staff from its tool and cutter grinding machines and measurement systems sectors who were formerly located in Fredericksburg, Virginia.

SST Opens Largest EDM Consumables Facility in North America

SST, a global distributor of leading machine tool and consumable brands, held a ribbon-cutting ceremony Oct. 30, to officially open its new facility in

Industry News

New Britain, Conn., alongside Mayor Erin Stewart. The facility is going to serve as SST's EDM consumable headquarters. The company reports this is now the largest EDM consumables company in North America.

Dating back to 1995, Global EDM Supplies forged its relationship in the New Britain community. Following the merger of Global EDM Supplies and SST, and the coming together in this modern high-tech facility, the opportunity exists to grow the history, leadership and established philosophy around the consumables business within the region and beyond.

The 40,000-square-foot space opened Nov. 18 and is designed to house the combined workforce of SST Consumables and Global EDM Supplies, including the service, application, sales and operation departments. Additionally, a Makino showroom is incorporated into the facility for machine demonstrations and training.

Design-2-Part Shows Announce 2018 Schedule, Includes Two West Coast Shows

Design-2-Part (D2P) Shows announced their 2018 show schedule. The eleven event slate includes six spring shows and five fall shows.

The schedule is anchored by six annual shows. D2P will hold these events in Grapevine (Dallas), TX; Atlanta, GA; Schaumburg (Chicago), IL; Santa Clara, CA; Long Beach, CA; and Marlborough (Boston), MA. The Long Beach show will rotate between Long Beach and San Diego giving Southern California manufacturers two convenient, every-other-year options. The D2P schedule is rounded out with five events that alternate every two to three years.

Design-2-Part Shows provide design engineers, manufacturing engineers, managers, and purchasers an

excellent opportunity to meet local and national job shops and contract manufacturers face-to-face to source custom parts, components, services, and design. Exhibiting companies will be showcasing their design-through-

manufacturing services featuring more than 300 product categories for the metal, plastics, rubber and electronics industries. The shows are working shows and visitors are encouraged to bring sample parts and drawings.

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Brett Green Joins Mahr Inc. as Vice President Sales Americas

Brett Green has joined dimensional metrology equipment manufacturer Mahr Inc. as vice president sales Amer-

icas. Green's responsibilities include overall management of the American sales region as well as general management of Mahr Inc.'s headquarters and manufacturing facility in Providence, RI.

Green comes to Mahr Inc. USA

from the UK where he was general manager - director sales & marketing for Hexagon Manufacturing Intelligence in 2016. Prior to that he served as general manager at Mahr UK from 2009 to 2012. Green began his career at KUKA and served in a number of sales and management positions before joining Mahr.



Davis, CA Open House Helps Local Companies Discover the Anatomy of a Machine Tool

DMG MORI's North American manufacturing facility, located in Davis, California, was opened in July 2012. DMG MORI is dedicated to offering customers comprehensive local service and support for the highest quality of U.S. made machine tools. At Davis Technology Days in November, visitors experienced live demonstrations on locally manufactured machines and took tours through the factory in Davis. They discovered how DMG MORI builds its machines seamlessly from design to production. They learned about the anatomy of a machine tool.

With a production capacity of up to 100 machines per month on a production area of 221,000 ft², the Davis location manufactures and assembles the 40-taper NHX 4000 2nd Generation, the 40-taper NHX 5000 2nd Generation, the 50-taper NHX 6300, the vertical machining center CMX 1100 V and the DMU 50 five-axis universal milling machine. The design and production activities are done by more than 135

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employees in California

DMG MORI employs a sophisticated automated factory for unattended, in-house machining of the most critical components for the machines produced at the North American manufacturing facility. The machining system includes four machining cells, eight CNC machines, more than 100 machine pallets and seven robots to complete the washing, cleaning and material handling. DMG MORI's cell control software (LPS) manages all of the machining programs, production schedules and provides all necessary control of production; monitoring and reporting of machine status is performed by DMG MORI's Messenger

software.

With a 100 percent component inspection of all critical components during the assembly process including accuracy, coolant leaks and function tests the machine tool manufacturer ensures that the product meets the highest standards.

Vero Software Hires Rocky Mountain Regional Account Manager

Vero Software has hired new account manager Heidi Hays to represent its Edgcam and Surfcam brands in the Rocky Mountain region. Based in

Denver, CO, Hays will helm management and growth of the two solutions in Colorado, Wyoming, Utah, Idaho and Montana.

Hays earned a Bachelor of Science degree in education, physical education and health education from Missouri State University. She has accrued nearly 14 years of sales and sales management experience delivering product development solutions and strategic staffing and recruitment services to manufacturing, engineering and software companies throughout the U.S. For the past four years, she worked in the CAD industry in the Western and Northwestern regions.



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Machine Tool Manufacturer Celebrates 70th Anniversary

The EMCO Group, better known as EMCO, is one of Europe's leading machine tool manufacturers providing high-quality, multi-functional metal-cutting machine tools. Across its 70 years, the Austrian machine builder has expanded its portfolio from a standard machine manufacturer to a turnkey solution provider delivering over 1200 machines annually.

EMCO Group engineers a range of machine tools from conventional turning and milling machines to CNC turning centers and vertical machining centers as well as fully automated manufacturing cells and high-speed milling and drilling centers.

Today, with production sites in

Austria, Italy, Russia and Germany, the EMCO Group ranks among Europe's leading machine tool manufacturers. Besides EMCO and EMCO MECOF, the Italian EMCO FAMUP adds a complete line of production machines for the machining industry including the Maxxmill 400 and 500 machines for the 5-axis machining of workpieces. EMCO MAGDEBURG, a specialist in the field of vertical lathes and milling centers, is also part of the EMCO Group.

Hudson Tool Steel Adds Latest Plate Band Saw

Hudson Tool Steel Corporation recently announced the installation of its seventh Amada plate saw, the NC controlled VM3800, in its California

facility. This is the seventh new Amada saw purchased by Hudson over the past ten months for its three processing and distribution facilities. Including the VM3800, Hudson has installed three HA250W's, one HA400W, one PC430X, and one VM2500, bringing the total number of premium saws to twenty-nine spread over facilities in California, North Carolina, and New Hampshire.

The Amada VM3800 can cut up to 150" long x 24" wide, all with NC precision. With a work-load capacity of 26,450 lbs., material can be stacked for further efficiency, passing the value on to Hudson Tool Steel customers through shorter lead-times and competitive pricing.

"Tool steel customers need quick deliveries. Sawing technology continues to advance, bringing greater speed



The advertisement features a close-up of a Renishaw REVO-2 probe, a high-precision tool used in CNC machining. The probe is black with green accents and has the Renishaw logo and 'REVO-2' printed on it. In the background, a Wenzel logo is visible on a blurred surface. A QR code is located in the bottom left corner of the image. The hashtag #moreparts faster is written in large white letters at the bottom of the image.

Industry News

and tighter cutting tolerances that gives Hudson the ability to give customers the highest quality cut product in a hurry. Hudson Tool Steel has aggressive plans to continue adding new saws as well as grinding and boring equipment throughout 2018 and 2019.” said Rick Resner, president of Hudson Tool Steel.

Hudson Tool Steel delivers material cut-to-order, on-size or oversize, including

Ellison Technologies Announces Northern California Sales Manager

Ellison Technologies has appointed Brandon Prater as sales manager for the Northern California region

representing: Doosan Machine Tools America, Tsugami, and GF (Mikron and AgieCharmilles) Machining Solutions.

As sales manager, Prater will be responsible for overseeing the growth and development of the region’s sales team.

Prater brings 23 years of industry experience with firsthand knowledge on all levels of manufacturing as a machinist, production supervisor, sales engineer and now sales manager. Prater originally joined Ellison Technologies from 2014-2015. “I am excited to be back with the Ellison team” said Prater. “I look forward to working with and expanding the Ellison customer network and helping our customers be even more successful.”

“We’re pleased to welcome Bran-

don back to the Ellison organization, said Bob Nugent, Vice President. “His extensive knowledge of the Northern California manufacturing market will help in building strong relationships with our customers.”



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Shawn Luschei Rejoins Kitagawa NorthTech

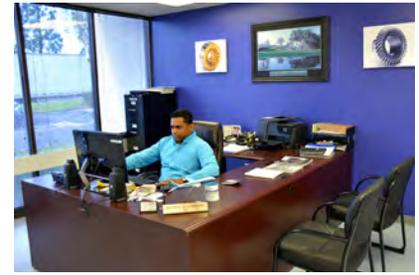
Shawn Luschei has rejoined Kitagawa NorthTech as senior manager of sales for North America. With more than 23 years of workholding industry experience, he will be responsible for managing regional sales managers, supporting OEMs and channel partners, and further developing the engineered rotational and prismatic workholding business for the company.

Mr. Luschei began his career in workholding with Kitagawa NorthTech in 1994 as an inside sales representative and was promoted to various sales management positions during his

17-year tenure at the company. In 2011, he left to launch Toolmex's new workholding and power chucks division.

Titanium Coating Services Moves Into Larger Location

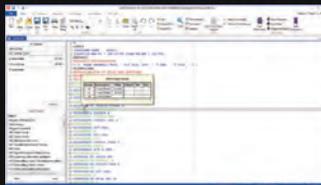
Titanium Coating Services has moved into a new 4000 sq ft. facility to keep with the growing demands of their business. The owner Mahesh Sukumaran stated, "Our state of the art PVD coating machine is from Performcoat. Performcoat is owned by the ex President of Balzers USA. We can do different types of coatings



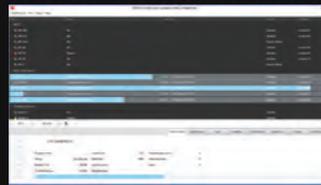
CEO Mahesh Sukumaran

in this machine like – TiN – TiCN – AlTiN – TiAlN – CrN – CrCN – ZrN and Hybrid Coatings like - TiAlCN – AlTiCN – AlCrN – AlTiCrN – TiCrN – AlTiSiN – AlTiCrSiN etc. We use a state of the art Ultrasonic Cleaning machine to clean parts before coatings". Mahesh also stated, "We have a

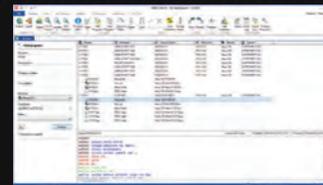
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HMC-204	541-4636	Marv	03:52	03:50
HMC-518	543-6460	Wallace	00:07	03:40
VMC-3Axis	Ingen	Patrick	00:00	00:00
HMC-48	1404	Roark Jr	03:21	03:50
507-5420		Stan	06:24	06:20
509-0159		Dwight	00:08	02:45
VXX-S	Ingen	Esther	00:00	00:00

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Industry News



video on our website which shows how the process works. We started in September 2017. We have a full quality control room, we check coating thickness and do certifications". He continued with "Many western region customers ship their parts all the way to the east coast to get their parts coated. What we want to do is save these customers time and money by having them use our local services. Many of our customers returned back to me from my previous company as they knew I will have a consistent coating, I always invite my customers to visit the facility, so they can see how their tools are handled. In my past job I had a history of very minimum coating failure and tool damage due to highly skilled workers and know the value of customers tools".

The new location is located at 720 N. Valley St, Suite #G-H, Anaheim, Ca 92801. www.pvdamerica.com/

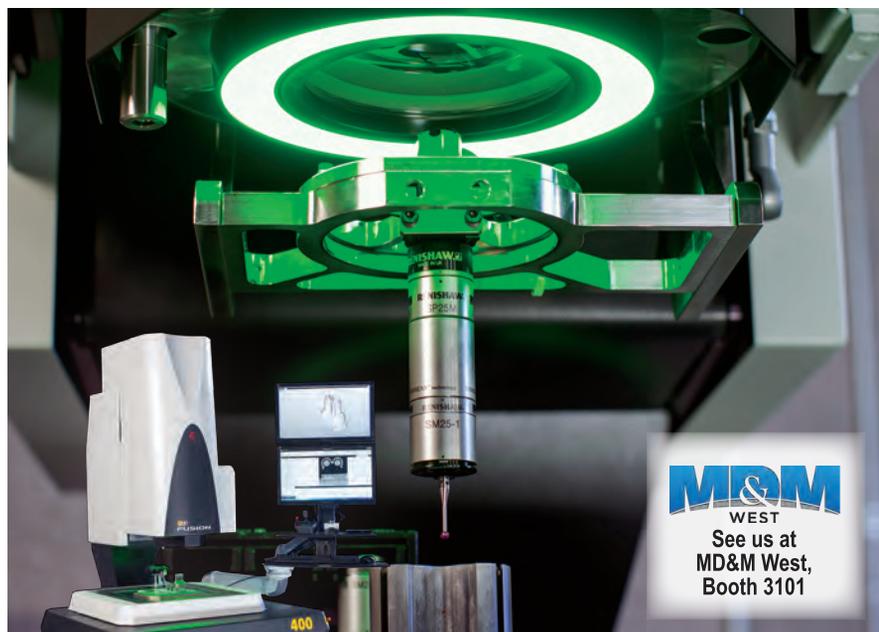
JTEKT Toyoda Americas Names Foothills Machinery Sales as Their Mountain-West Region Distributor

JTEKT Toyoda Americas Corporation announced the addition of Foothills Machinery Sales to their distribution network, further solidifying manufacturing capabilities and service in the Mountain-West Region. Colorado, Wyoming and New Mexico will be covered by the full-service Broomfield, Colorado based distributor who now carries

Toyoda's whole lineup of machining solutions.

As Colorado's oldest independent dealer, Foothills Machinery Sales joins the Toyoda team with a 10,000

sq. ft. facility, home to a respected and knowledgeable service and sales staff. "Our team is really looking forward to expanding our capabilities with Toyoda," said Troy Kattenhorn,



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Industry News

vice president of sales at Foothills. “Having access to their technology and combining our engineering, sales and service support teams promise a great outlook for manufacturers in the Rocky Mountain region.”

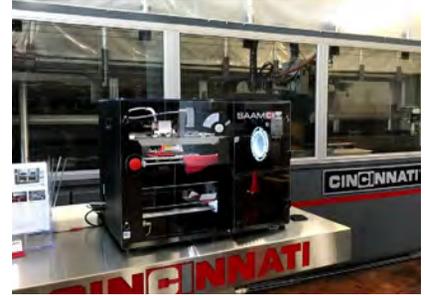
Cincinnati Incorporated Expands Additive Manufacturing Efforts with Acquisition of New Valence Robotics Corporation

Cincinnati Incorporated (“CI”) and New Valence Robotics Corporation (“NVBOTS”) announced the closing of CI’s acquisition of NVBOTS. All employees of NVBOTS will be retained and the base of operations will remain in Boston, MA for the

foreseeable future. Other terms of the acquisition were not disclosed.

CI partnered with NVBOTS as a value-added reseller in 2016 to complement BAAM (Big Area Additive Manufacturing), its large-scale additive machine tool solution. The NVBOTS small-scale 3D printer, rebranded as SAAM (Small Area Additive Manufacturing), offers large-scale designers a “print preview” for large prints and also penetrates new market segments outside the scope of BAAM.

“Cincinnati Incorporated’s participation in additive manufacturing has been within the large scale arena with BAAM. NVBOTS naturally complements CI’s capabilities with smaller scale additive manufacturing systems, the growing ability to print in a wide array of materials, and automated solutions including cloud based man-



agement software,” said Carey Chen, CI president, CEO, and vice chairman.

“This partnership represents an exciting opportunity to extend NVBOTS’ core mission to make 3D printing as easy as printing on paper, and to fulfill our long-term vision where anyone can 3D print any part, in any material, anytime, anywhere,” said AJ Perez, NVBOTS chairman and co-founder.

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New Products



New VMC With Dual Spindle Design —Doosan

Doosan Machine Tools announces the addition of the DMP 500/2SP to its line of vertical machining centers. Equipped with two spindles and two automatic-tool-change (ATC) systems,

this new model was designed for production job shops and high volume parts manufacturers.

Compared to single-spindle machining centers, the DMP 500/2SP effectively doubles productivity by machining two parts simultaneously, as well as greatly reducing work loading, unloading and idle times. For reduced setup times, the right spindle features a W-axis adjustment of 0.8 in, allowing any variability in fixture heights between spindles to be quickly compensated for.

12,000 RPM direct drive spindles with 87 lb ft of torque are standard, and 8,000 RPM spindles with 211 lb ft of torque are optional. The load capacity (1,763 lbs.) and table size (47 x 20.5

inches) easily accommodate a variety of workpieces and fixtures, and together with the 20.5 inch Y axis stroke, offer a machining space well suited for a range of parts.

Dual 24-tool capacity magazines are standard, and 30-tool and 40-tool magazines are optional. The dual ATCs boast 1.7 second tool-to-tool times, keeping the tools in the cut longer.

“Built to machine high volume parts with great efficiency, the DMP 500/2SP delivers extreme value with its high productivity, compact size and excellent reliability,” said Jim Shiner, director of sales and marketing at Doosan Machine Tools America. “It can output the work of two machining centers in a smaller footprint with considerably less capital investment.”



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New Products

Unique New Benchtop Vision System —L.S. Starrett

The L.S. Starrett Company has announced the introduction of the HVR100-FLIP, an innovative new large field-of-vision (FOV) benchtop vision measurement system that is capable of being used in either a vertical or horizontal orientation, features a high-resolution digital video camera and minimal optical distortion for accurate FOV measurements of up to 3.65". The "FLIP", developed by Starrett Kinematic Engineering Inc., a subsidiary of The L.S. Starrett Company, made its North American debut at The Quality Show in Chicago, October 24th, 2017.

The FLIP horizontal or vertical orientation feature lends itself to an

extremely wide array of applications from flat parts such as gaskets and seals, to turned and threaded parts. The system can be easily changed over from vertical to horizontal and back within minutes, and can be placed on most sturdy workbenches.

The compact Starrett HVR100-FLIP has a 24" LCD touch-screen monitor, a 13.7" x 6.5" stationary top plate and 6.5" optics travel with a motorized power drive for accommodating various part sizes and enhanced performance. An LED ring light provides surface illumination and LED backlight offers transmitted illumination.

The main operator interface of the FLIP displays a live video image with software measurement tools and graphical digital reading of measurements.

A part image can be resized using pan, zoom and measurements by simply tapping a feature on the monitor screen. A wireless keyboard and pointing device are also provided for entering file

names and targeting key functions. Met-Logix M3 software includes

2D geometric functions such as points, lines, circles, arcs, rectangles, distances, slots, angles and skew, and utilizing the part design DXF/ CAD file digital overlay makes part inspection simple.



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New Products

New Grooving Tools for Swiss Machines—Tungaloy

Tungaloy is broadening its TetraMini-Cut series of grooving tools for Swiss-type machines to include

new insert lines for the general lathe market. The products feature compact, four-cornered inserts that are securely clamped in a pocket for indexing repeatability and tool life stability.

The line now includes two chip-

breaker styles. The TCG chipbreaker incorporates optimized rake angle and edge preparations and is suited for the automotive industry. The TCP chipbreaker features a large rake angle with a sharp cutting edge. Its maximum depth of cut is 0.14", enabling a range of applications. To meet the requirements of small and miniature part manufacturers grooving with R0.004" or smaller, the TCP line also includes inserts with R0.002" corner radii.

The series also includes the AH7025 grade, featuring a nano-multi layer PVD coating with high aluminum content for cutting various materials while minimizing common grooving issues including chipping, fractures and plastic deformation on the cutting edge.

Modular Tower System for CMM's—Phillips Precision

Phillips Precision offers a modular tower system as part of its Lean Inspection Arsenal workholding line for coordinate-measuring machine (CMM) inspection. First in the line of tower modules is a 2" interlocking system that can be built both vertically and horizontally. Cubes added horizontally can be turned to any angle and locked securely.

The modular system is intended to maximize the CMM work envelope without interfering with probe travel. A "building block" design enables users to determine the height of the setup. A staggered hole pattern adds flexibility for workholding. The modules enable building up the setup both vertically and horizontally. Horizontal cubes can be secured at any angle.

Pre-configured systems include several interchangeable components: an adjustable base, 2" x 2" cubes, a 4" blank spacer block, and 2" and 4" posts that connect the system and provide pivot points. Each cube has 10 (1/4-20)

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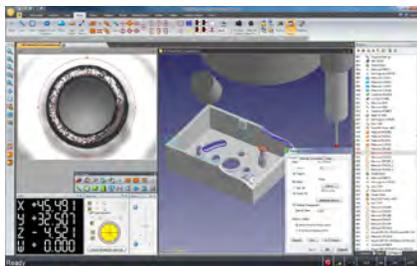
New Products

holes per side for flexibility in holding positions and a 3/8-16 threaded center hole that allows cubes to be added horizontally. Highly accurate components are designed with male/female locating features and are made from black anodized aluminum.

CMM Manager 3.7 For CMM, Portable and iNexiv Systems

—Nikon Metrology

Nikon Metrology introduces CMM-Manager 3.7, the latest release of 3D Metrology software for 3rd party CMM upgrades and Nikon Metrology's CMM, portable, and iNexiv vision measurement hardware. CMM-Manager 3.7 adds support for Renishaw SP25 on Mitutoyo CMM, improved support for Renishaw UCC Server, updated Gear Module, reporting and vision enhancements, and improved CAD graphics display.



CMM-Manager supports use of SP25 on five DCC CMM controllers including Nikon, Sheffield, Renishaw, I++, and now Mitutoyo UC200. SP25 support includes automatic sensor calibration, full Path Planning for all measured feature types, statistical filtering of measured results, and complex Cloud scanning for irregular shapes.

It supports UCC Server version up to 5.0.3. Probe Assembly, Tip Calibration, Machine Volume, Table Height, Calibration Sphere, and all CMM setup parameters are automatically synchronized via X-Path for UCC I++ interface.

Gear Module enhancements include Export measured data points from CMM-Manager Gear Module into Zeiss Involute Pro format. Allows Gear Module user to use external ap-

plication for gear analysis as well as built-in gear reporting tools.

Reporting enhancements include an improved True Position Report for



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iNexiv and Vision enhancements include more robust Pattern Recognition by performing iterative Pattern Matching. Unknown Edge Profile measurement with improved accuracy and vision tool placement. Statistical point filter for line, slot, and circle features. Toggle between Live Video, imported image, or static image from external digital camera.

The software has improved 3D CAD and text display. It has larger and

smoother text in main graphics, text reports, and graphical reports. OpenGL smoothing enabled for feature, CAD, and line display in main graphics and graphical reports. View manipulation automatically rotate about center of current feature operation.

New Compact Rotary Table —Index Designs

Index Designs introduces a new compact model to their line of 4th and 5th axis CNC rotary tables and indexers. The all new VH-6 rotary table has a 6.3" diameter platter with six T-slots and a standard 6-hole bolt pattern with threaded holes for mounting a chuck.



The rotary table has a center height of 5.5", a 1.510" through-hole with a 1.625" locating feature.

The spindles unique well-spaced dual tapered roller bearings are designed to spread the load from front to back providing rigidity and dampening vibration during heavy cuts. In addition, a pneumatic brake system provides more than 200 ft.-lbs. of holding torque. The VH-6 has a 60:1 gear

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ratio that is helically cut and throated for increased surface contact between the gear and worm which provides longevity, reduces backlash and helps maintain accuracy and repeatability. Positioning accuracy is +/- 15 arc seconds with 4 arc seconds repeatability with a maximum of 30 arc seconds of backlash. The motor cover on the VH-6 is completely sealed and pressure tested for leaks, protecting the motor from any coolant contamination. The VH-6 weighs approximately 125 lbs. For smaller collet sized parts, an optional 5C nose piece with a manual or pneumatic draw bar is available.

The VH-6 is built to interface with virtually any CNC machine control on the market and will operate as a true 4th axis capable of simultaneous

contouring or simple point to point indexing to any angle as little as .001 degrees. Providing the CNC machine tool is 4th axis ready and ladder work is completed, Index Designs will build the rotary table with the compatible motor and cables for easy connection to the CNC machine control.

If 4 axis simultaneous contouring is not required, Index Designs offer their rotary tables with a programmable control box that can be interfaced and triggered using a spare M-function from a CNC machine. For applications on other types of manual or non CNC machinery where point to point parts positioning is needed for secondary operations, a micro-switch can be used to quickly and automatically step through the program.

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Next-Gen EDGE-Series to Support General Precision Machining Applications —Makino

Makino presents its next-generation EDGE-Series machines, the

EDGE2 and EDGE3, to the U.S. manufacturing market. Built for general precision machining applications, both electrical discharge machines (EDM) provide accurate and reliable performance for standard die/mold components or contract manufacturing

with a space-saving design for shop floors of any size.

The EDGE-Series sinker EDMs feature an integral rise-and-fall work tank designed with excellent unobstructed access to the work zone for setups, which greatly improves visibility to monitor the machining processes. The machines include an eight-station automatic tool-changer (ATC) to extend unattended operation, and fully support robotic automation.

Features include the SuperSpark4 which dynamically optimizes the power discharge levels and jump cycles. Intelligent Expert System (IES) has advanced adaptive power to automatically stabilize EDM processes and enhance accuracy. The MGH6 control features a 15-inch touch-screen control system and simplified programming using the Makino Program Generator (MPG) function.

2D Quick Image QI-C Series with Motorized Stage —Mitutoyo America

Mitutoyo America Corporation announced the release of the Quick Image CNC (QI-C), the latest addition in the Quick Image Series of 2D vision measuring systems.

The Quick Image series of telecentric lens-based 2D video inspection systems has expanded the lineup to include three new models with a moving stage. Combined with the moving stage, the QIPAK software now includes an image stitching function. The small footprint and ergonomic design are well suited for a variety of inspection tasks, both in the lab and on the shop floor.

For larger workpieces, the combination of the moving stage and image stitching allows for entire coverage of the measuring envelope, creating a single stitched image on which edge

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detection can be applied. QIPAK software creates inspection routines, part programs and repeat measurements using a single mouse click. The telecentric all-in-focus optics is suited for shafts, stampings, plastics, electronics and other difficult-to-focus workpieces.

The QI-C Series features a wide field of view (32 x 24 mm), depth of focus (up to $\pm 11\text{mm}$), fully motorized X-Y stage and the latest QIPAK software, providing the user with automated measurements throughout the range of stage travel. The telecentric optical system, combined with the image stitching capability of QIPAK V6.1, allows fully automated wide-area measurements. The QI-C Series is available with 0.2X optical magnification, measuring accuracy of $(3.5 + 0.2L)\mu\text{m}$, and measuring range options of 200 x 100mm, 200 x 170mm and 300 x 170mm.

Measurement results are displayed in real time directly on the video image. High-luminance with the built-in LED

lighting, and megapixel color camera enable observation and measurement using high-resolution images.

New Line of Abrasive Waterjets —Omax

Omax Corporation, announced the release of its GlobalMAX product line, designed to bring the versatility of waterjet machining to a wider range of customers.

GlobalMAX machines are designed, manufactured and tested as an integrated system, including an energy efficient direct drive pump, a table that provides access on all sides

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and a motion control system created specifically for abrasive waterjets. The Intelli-MAX control software that comes with GlobalMAX waterjets al-

lows operators to import part files from any major CAD or graphics programs, or create drawings from scratch.

Omax reports that because abrasive waterjets use a cold cutting process,

there is no heat-affected zone (HAZ), and therefore, no distortion to the work material and often no need for secondary finishing operations.

The company reports that GlobalMAX waterjets can easily cut materials that are often difficult to cut using traditional machining methods. Material can be stacked and parts can be nested.

GlobalMAX abrasive waterjet systems are available in three different cutting bed sizes, 2'7" x 5'; 10' x 5'; and 13'3" x 6'8". There are also two direct drive pump sizes available, 20 HP and 30 HP.

The machine does X- and Y-axis cutting with three degrees of freedom.



New CNC Control Kits

—Centroid

Centroid has announced an all new CNC controller kit aimed at the OEM and do-it-yourself (DIY) CNC control builder called the Acorn CNC controller.

“The Acorn CNC controller is a 4-axis CNC control system that combines Centroid’s CNC12 CNC control software and offers the DIY user industrial grade CNC features, options and performance at an entry level DIY price point,” said a company spokesperson. Both mill and lathe CNC software are included. The CNC control board hardware and CNC12 control software are included with the kit.



“The Acorn control hardware was designed from the ground up to work in conjunction with Centroid’s CNC control software, eliminating typical hardware/software incompatibility issues found on other DIY systems,” said the spokesperson. The Acorn control-

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ler connects to a Windows 10 PC via Ethernet for PC to CNC hardware communication. The Acorn controller can command most all servo motors and drive packages as well as stepper motors and drive. Features include, Rigid Tapping, Constant Surface Speed, Threading, Threadmilling, Profiling with auto clean out, Conversational Programming, Industry Standard G- and M-codes, Automatic Tool Height Measurement, Part/Fixture probing and 2-D and 3-D digitizing. The Acorn CNC12 software is available in three price and feature levels “Free”, “Pro” and “Ultimate”.

The Acorn control board is equipped with a Legacy DB25 connector so users looking to upgrade older CNC control systems based on the old Mach3 parallel port connection can easily do so.

The Acorn CNC control has its own dedicated high speed CNC motion control CPU.

The Acorn also can command a variable frequency drive (VFD) with its built in 0-10 vdc analog output for spindle motor control. Acorn also has an encoder port on-board for spindle encoder feedback for machine tools that require for real time RPM display as well as rigid tapping, threading and CSS capabilities.

Simonds Saw Data Program Supports Industry 4.0 Initiatives —Simonds Saw

Simonds Saw has announced that its European partner, WESPA® (Mel-



sungen, Germany) has introduced the ability to produce instant “blade-to-machine” data transfer of machine-specific cutting parameters for its Individual Performance Cutting (IPC) custom band saw blades program. This innovative instant data transfer technology directly supports the Industry 4.0 concept.



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By using a mobile device and scanning a QR code on the saw blade or blade box, saw operators can point the scan to the machine to transfer a complete, unique data set so the machine can begin cutting. “We were excited to have introduced our instant blade-to-machine technology at EMO this year, where it was extremely well received.” said Mr. David Miles, president of Simonds Saw.

Industry 4.0 is a current manufacturing trend designed to increase automation and data exchange from machine to machine. Using this technology, machines share and process data, adapting and recalibrating as

needed to maximize performance. Industry 4.0 is essentially “artificial intelligence meets manufacturing”.

New 8KW Electra Fiber Laser —LVD Strippit

LVD Strippit announces the launch of the Electra FL 3015 8kW fiber laser cutting machine. The company reports the Electra 8kW can maintain 2G acceleration speed while cutting, producing high quality, high accuracy cuts in simple to complex configurations. The Electra FL also features a new cutting



head, new “smooth lead-in” feature, advanced drive system and the latest generation of LVD Strippit’s intuitive Touch-L control.

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Electra is equipped with an advanced cutting head featuring automated adjustment of focus position and focus diameter (zoom focus).

The Electra uses a linear drive system to harness the full benefits of higher power cutting capability. Electra's high cutting dynamics and rapid acceleration achieve high part output. The machine's rigid frame design ensures that cutting performance is reliable at top cutting speeds.

The Electra features the latest generation of LVD Strippit's 19" Touch screen graphical interface, making the system easy to operate for virtually any level of user. An icon-driven user interface guides the user through all necessary man-machine interactions.

Electra offers two levels of automation: An automated load/unload system designed to keep pace with Electra's high cutting speed (FA-L), or a Compact Tower (CT-L), offering full capabilities for loading, unloading and storage of raw materials and finished parts.



5-Axis Rotary Table TAP for Small Vertical Machining Center —EXSYS

EXSYS Tool Inc., the exclusive North America supplier of Swiss-manufactured pL LEHMANN ultra-high precision rotary tables, has introduced

a new space-saving 5-axis rotary table TAP for small, high speed vertical machining centers. EXSYS reports the table TAP allows users to upgrade a vertical machining center.

In conjunction with the right machine, the 5AX rotary table TAP cre-

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New Products

ates a very compact and economical 5-axis machining center for small and medium-sized work pieces up to a cube of approximately 5.9”.

The 5AX rotary table TAP expands the pL LEHMANN 500 series of modular multi-axis rotary tables from four basic models to five. Adaptable to nearly any workpiece or production situation, 500 series tables can be assembled into as many as 240 different configurations. More than 20 different clamping methods and behind-the-spindle accessories that include rotary unions, special clamping cylinders and angular position measuring systems further extend the system’s adaptability.

Despite their space-efficient dimen-

sions, the tables and spindles offer strong resistance to pull-out torque and axial force while providing high levels of clamping torque. Engineered for low power consumption and light weight, the tables feature IP67 rated enclosures.

The series includes both single-spindle and multi-spindle tables that are available in 4-axis and 4/5-axis versions. Swiveling-bridge-style 4-axis tables employ the roto-FIX clamping yoke for machining of multiple parts. The tables’ backlash-free preloaded gear drives (PGD) provide both high torque and high rotation speeds, with spindles capable of 47-111 rpm and cycle times for 90 degrees of 0.34 sec. pL Lehmann 5-axis tables operate in

simultaneous machining or 3+2 positioning modes.

New EDM Monitoring Control —Mitsubishi EDM

The new M800 EDM control is now included in Mitsubishi wire EDM machines to increase productivity and help keep track of production jobs.

The M800 series control uses rotational and tilting functionality, while providing job monitoring and important information in a single view. The 19-inch touchscreen enables the user to swipe, pinch and tap to view, making it



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a much easier interface to interact with than previous models.

In line with Industry 4.0 requirements, the processable data available with this control ensures transparency in all production stages. The new navigation interface provides smooth and easy job operation time for all operator

expertise levels, allowing production jobs to be completed quickly and accurately.

Additionally, the M800 control enables the user to analyze machine profitability and see reserves to optimize processes and boost efficiency. Diagrams are available to depict operating costs and output, and all operating material statuses and maintenance cycles can be called up at a touch.

Currently, the MV1200-S, MV1200-R, MV2400-S and MV2400-R Advance wire EDMs feature the M800 control. MC Machinery is working on incorporating this technology in its laser machines as well.

New 20-Ton Utility Hydraulic Press —Dake Corp.

Dake Corporation has introduced the F-20 manual utility press. This 20-ton hydraulic press features a two-speed pump for fast pressing power and a traversing head to adapt to different size workpieces.

“The Dake F-20 hydraulic press is designed to bridge the gap between small, low-capacity devices and large-scale machinery,” said a company spokesperson.

“Made with a heavy steel frame, adjustable table and traversing head, this hydraulic press can adapt to many different workpieces and applications.”

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the spokesperson said. “Designed to withstand 20 tons of pressing power, the F-20 offers more capabilities than its 10-ton partner model. The most impressive component to this hydraulic press is the two-speed pump that allows faster ram advance.”

Featuring table plates, a pressure gauge and a step nosepiece, the F-20 utility press is suitable for any small fabrication shop or home garage workshop.



New Compact Die Sinker —GF Machining Solutions

GF Machining Solutions’ new compact FORM E 350 machine is an ideal die sinking EDM solution for small shops. A sturdy C-axis construction,

cross table and cast-iron frame offer high stability and force reduction.. The company reports that integrated glass scales preserve long-term, repeatability and eliminate the need for recalibration.

The latest-generation Intelligent

Speed Power Generator (ISPG) on the FORM E 350 excels at superior surface finishes and precision applications in any conductive material. It overcomes common process challenges for copper electrodes, including electrode wear induced by electrical discharge.

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

The machine console comes equipped with the user-friendly AC FORM HMI (human machine interface) that is based on a standard Windows® platform and offers interactive graphical assistance so that

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all operations, such as measurement and machining cycles, are illustrated by graphics/icons for fast operator understanding and ease of use. It provides simple descriptions of machining targets, automatic selection of optimal technology and dynamic parameters adaption.

With an X/Y/Z travel of 17.8" x 9.8" x 9.8", the FORM E 350 handles workpieces up to 31.5" x 19.7" x 10.4". It also has a four-position linear tool changer.

The FORM E 350 is automation ready and can easily be paired with the System 3R WorkPartner 1+ robot to implement unattended night and weekend operation.

New Go/No-Go Gage Sets —Slater Tools

Slater Tools introduces its new and comprehensive product line of Go / No-Go gage sets for customer-specific applications. The full range of gages are designed and engineered precisely to inspect your parts for machining process variations such as form size, twist and tool wear.

Ideal for use with Slater Tools rotary broaches, these gages are held to extremely tight tolerances, within .0002 inches. They are produced from oil hardened M2 high speed steel and can be custom made to any shape or size to fit custom needs.

All gages are offered for numerous

shapes, either as full form composite, sector or progressive forms. Both plug and ring gages are offered for checking internal or external forms. The company offers long form gage certification upon request for those applications and industries that require it.

Popular shape gages, such as hexagon and six lobe (hexalobular), are available as standards in both inch and metric dimensions. Custom plug and ring gages are also available with rapid turnaround times. Both standard and custom inspection gages are available as Go/No-Go sets or can be purchased individually.

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New Products

New Modular Round Chamfering Tool —Big Kaiser

Big Kaiser has introduced the R-Cutter CKB Type, a new modular round chamfering tool. The R-Cutter CKB3 & CKB5 is an ultra-high feed front and back radius chamfering mill which features high rake angles that reduce cutting resistance and minimize burr generation.

The R-Cutter CKB Type offers a unique insert geometry, providing extreme sharpness. The radius chamfering mill is offered as a four-insert design to cut in the tightest of spaces and for higher feed rates.



The CKB connection is equipped with a floating drive pin which engages on both sides into respective pockets in the mating part. The tapers on the pins and the angles on the pockets are engineered to permit an automatic balancing of the two resulting torsional forces.

Additionally, the CKB connection allows for an array of standard shanks and extensions to be adapted with the heads to create “custom” tools to extend over 16 inches, maintaining damping near the cutting edge and managing vibration in long-overhang setups.



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5 Axis DMU 90 P duoBLOCK® —DMG MORI

5-axis machining of the highest level is also the trademark of the fourth generation of the successful duoBLOCK® series. Features here include the highly stable design of the universal machines, long-term accuracy and highest precision with up to 4µm positioning accuracy even in the standard version. This latest model is designed as a package machine with a high-performance motor spindle, space for 60 SK50 tools and IKZ coolant unit.

DMG MORI has now expanded its range to include the DMU 90 P duoBLOCK® geared especially towards the universal machining typical for tool and mold making and mechanical

engineering. It has an X-axis travel of 35.4 inches and workpiece weight of 3,970 lbs. DMG MORI has concentrated on heavy-duty machining and offers the DMU 90 P duoBLOCK® as an appropriately equipped package machine.

The equipment package of the DMU 90 P duoBLOCK® includes a vertical chain magazine with space for 60 SK50 tools and a powerful 69.7 hp motor spindle. With 12,000 rpm and a torque of 317 ft lbs, it can handle even demanding machining tasks. A spindle growth sensor, machine protection control and a 600-liter IKZ coolant unit with 40 bar and 23 l/min round off the basic machine.

Numerous options mean the basic machine can be adapted individually



to meet higher requirements, among other things with a motor spindle that achieves 15,000 rpm and a torque of 297 ft lbs. The tool magazine can be expanded to 90 SK50 pockets, with HSK A100, BT50 and CAT50 tool holders also available as an alternative plus a 980-l, 80-bar IKZ coolant unit. Workpiece measurement in the work area using a Blum laser system and a

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3D quickset can also be implemented.

The standard version of the DMU 90 P duoBLOCK® is equipped with CELOS® and a SIEMENS 840D solutionline. The HEIDENHAIN TNC 640 3D control is also available as an alternative.

Machinist Publishes Book About 5-Axis CNC Technology

The Power of FIVE: The Definitive Guide to 5-Axis Machining book was officially released in October at an industry conference, Top Shops, in Indianapolis. The author, Michael Cope, is a machinist and works at Hurco as a

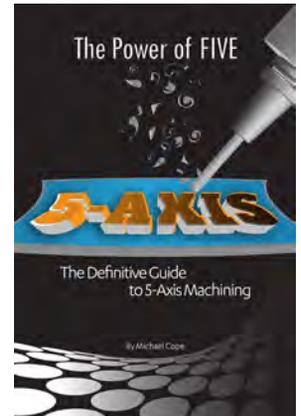
product technical specialist.

Cope said he wrote the book because the adoption of 5-sided machining processes is the most efficient way for job shops to instantly increase productivity and profitability. While there are other books about 5-axis CNC technologies, he saw a need to write a book specifically for machinists.

“I’ve always seen myself as a machinist first and wrote this book with the intention of educating machinists and shop owners on the value of 5-axis machining because I truly believe it is the future of our industry and the most efficient way to produce parts. Making the transition to 5-sided machining on a 5-axis CNC machine solves many of the problems so many shops face:

finding qualified machinists (the skills gap); excessive set-up costs due to inefficiency; and reacting to pressure from customers, both pricing pressure and delivery pressure.

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industry, 5-axis makes each part more profitable. It offsets the skills gap issue because you can do more with fewer machines – which means you won't need to find as many skilled employees. The technology makes the process more efficient, which means shops increase productivity because they don't waste time flipping parts. Making the transition to 5-sided machining on a 5-axis CNC also helps job shops respond effectively to pressure from customers because they can switch from one job to another quickly and efficiently. Basically, you can do more with less if you select the right 5-axis CNC machine," Cope said.

The book is available at Hurco.com/5-axis

Fully Automatic Vertical Tiltframe Bandsaw —Cosen

Cosen's AV-2026NC bandsaw is designed to meet the need for more automation in structural steel fabrication. It combines Cosen's vertical tilt frame saw with an automated feeder for a fully automatic system. The end result is an advanced saw that allows operators to push a button and walk away until the job is completed.

The groundwork for full automation began about six years ago with the introduction of the manual and semi-automatic versions of the vertical tilt frame saw, the MVC-670DM

and the SVC-670DM. The culmination of Cosen's product development initiatives resulted in the AV-2026NC, which combined a fully automated saw in vertical tilt form.

The automatic saw is suitable for manufacturers who have more complex angles to cut either on the front end, the back end or both. It is capable of making a bull nose angle cut, which manufacturers often use to make bracing parts. The saw is also capable of making opposing angles, parallelograms, polygons and straight cuts.

The operator can choose from a number of cut configurations on the easy to use touchscreen and the saw takes care of the rest. It has a max.

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capacity of 20" x 26" at 90° in an 180" long by 135" wide footprint. The saw feeds up to 59" per single shuttle that can be programmed to index up to 999" of material.

TNC 620 Control Now with Touchscreen Technology —HEIDENHAIN

The TNC 620 control with touchscreen is operated by gestures, similar to smartphones or tablet PCs. The

operator can navigate quickly and intuitively through long lists, programs, tables and other content by what is known as kinetic scrolling.

A slow, brief swiping movement results in scrolling over a few lines; a longer and quick movement leads to dynamic scrolling over many lines. With a short tap, the user can stop the dynamic scrolling at any time. That makes it possible to easily find, for example, an NC block or a tool in long NC programs or tool tables. In the 3-D test mode, zooming in and out as well as moving and rotating objects is particularly helpful. Further, a pop-up keyboard appears for text input.

The new MC 8410 main computer with touchscreen technology in the TNC 620 corresponds to the MC 7410 in the prior solution with this functionality. For the machine builder, a newly designed machine control panel MB 721 with or without functional safety is also available with the touchscreen, and features three optional elements that can be assigned to additional keys, key switches or a USB connection.

The previous MC 7410 has also been revised and is now available in a new variant. It can be used with the new MB 721 (FS). This enables the OEM to use the MB 721 (FS) as a standard and choose between the MC 8410 with touchscreen or the conventional MC 7410 main computer. Both units have an Intel Celeron Ivy Bridge processor, Dual Core with 1.4 GHz and 2 GB RAM memory.

On the software side of the TNC 620, the large range of standard cycles for milling, drilling and boring machines and optional probing functionality remain compatible with older control versions. The TNC 620 comes standardized as 4-axis control.



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New Products



New Mikron HSM 500 Graphite —GF Machining Solutions

GF Machining Solutions has unveiled the new Mikron HSM 500 Graphite high-speed mill. The system combines the features of a dedicated graphite machine with the flexibility of the company's HSM 500 high-speed milling platform. Clad in black paint to denote its specialty, the machine sports an optimized Step-Tec 42,000-rpm spindle, a sophisticated exhaust system and the ability to quickly switch between wet and dry machining.

The flexibility of the HSM 500 Graphite ensures that shops can have an all-in-one high-speed milling solution that allows for wet applications while at the same time benefiting from a machine that specializes in graphite applications. Its high-dynamic drives, polymer concrete base and improved spindle allow the machine to hold extremely tight tolerances, such as those required for advanced glass molds and other graphite parts.

The HSM 500 Graphite includes the Operator Support System for automating complex machine setting changes, Intelligent Thermal Control for warm-up time reductions as well as what the company reports is the highest possible accuracy and an Advanced Process System for on-the-fly control

of spindle functions.

GF Machining Solutions has also designed the machine around its automation and die-sinking EDM lines to provide customers with a complete

manufacturing solution, making it easy to pair the HSM 500 Graphite with such machines as a System 3R Work-Partner 1+ and an AgieCharmilles FORM P 250.



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...Hotline Continued From Page 8

Boeing, Singapore Airlines Announce Order for 39 Airplanes

Boeing and Singapore Airlines in late October formally announced a deal for 20 777-9s and 19 787-10s, during a ceremony at the White House.

The order, previously attributed to an unidentified customer, is worth \$13.8 billion at current list prices. The value of this sales transaction will sustain thousands of U.S. suppliers and more than 70,000 direct and indirect U.S. jobs during the delivery period of this contract. The airline also has options for 12 additional aircraft, six of each aircraft type.

Northrop Grumman To Build Three High-Flying Surveillance Aircraft for Japan

Northrop Grumman Corp. will build three copies of its high-flying surveillance aircraft, Global Hawk, for Japan.

The business received a \$130.5 million contract for components that require long lead times. The Pentagon's contract listing said the total deal will include three Block 30 (I) air vehicles, two ground control elements, enhanced integrated sensor suite, spares and a site survey.

Northrop Grumman bases its Global Hawk program in Rancho Bernardo, CA. though the aircraft are actually built in Palmdale. The contract runs through 2018.

SpaceX Gets Additional \$100 Million in Funding

SpaceX, the Hawthorne, CA-based rocket company founded by billionaire Elon Musk, added \$100 million in new funding to its recent haul, bringing the total raised since late July to \$450 million, according to a November 28 filing with the Securities and Exchange Commission.

The amended Series H round includes 25 unnamed investors and values Space Exploration Technologies Corp. at \$21.5 billion, putting it among the world's most valuable privately owned firms, according to Equidate, a marketplace for private company stock.

Last month, NASA awarded SpaceX a \$97-million contract for a Sentinel-6A mission in

2020 aboard a SpaceX Falcon 9 rocket to study ocean topography and weather data.

Portland Area Vigor Wins Award to Build the U.S. Army's Maneuver Support Vessel

In a highly competitive bid process, the U.S. Army has chosen the Vigor design for its new generation of landing craft. The contract represents the largest award in Vigor's history with a total value of \$979,390,000 over a ten year period and will provide sustained full time employment for roughly 200 skilled artisans.

"This award is the culmination of a five year process of research and development that first began with Kvichak prior to its merger with Vigor," explains Frank Foti, Vigor CEO.

"Phase one of the program will begin immediately and center on design refinement and prototype construction," said Tim Kolb, general manager of Vigor Ballard who spearheaded the proposal process. "The contract calls for one prototype vessel, four vessels under low rate production, and up to thirty two additional vessels for use by Army Mariners in even the most difficult environments."

Cubic Making First Foreign Sale of Its GATR Satellite Equipment

San Diego based Cubic Corp. received a \$5 million contract to supply its GATR portable satellite dishes to New Zealand's military services.

It's the first foreign sale for its GATR equipment, the business said Oct. 16.

Cubic will supply 7.8-foot (2.4-meter) inflatable satellite antennas with supporting hardware, spares and training to the New Zealand Defense Force. They will be part of New Zealand's Network Enabled Army program.

Xcor Aerospace Files for Bankruptcy

Xcor Aerospace has filed for Chapter 7 bankruptcy and will liquidate its assets after failing to line up new investors.

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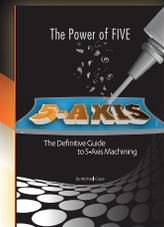


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Fig 3
Washing machine
Mill S 400 High-speed Milling machine
FORM 2000 VHP Die-sinking EDM machine
CUT 2000S Wire-cutting EDM machine
3R CellManager Modular Job and Cellmanagement system
Transformer Palletchanger with a transfer weight of 100 kg, Dynafix Pallet 280mm x 280mm

Increasingly demanding requirements in the medical device industry mean that the design of medical instruments, implants and prosthetics is continuously optimized to the extent that every surface now has one or more functions, or offers a range of features.

Increasingly demanding requirements in the medical device industry mean that the design of medical instruments, implants and prosthetics is continuously optimized to the extent that every surface now has one or more functions, or offers a range of features.

Nowadays, permanent implants manufactured from a single part are particularly in demand to avoid problems during assembly. Since the pre-cleaning of the individual elements is combined with the final cleaning during assembly, this often results in issues in terms of validation – particularly when drying after using water-soluble cleaning agents.

Against this background, design engineers are required to develop permanent implants from a single part, knowing that multiple technologies must be used or combined in the manufacturing process in order to meet all technical specification requirements (fig. 1). In addition, implants for the same purpose have to be produced in different sizes in order to meet different patient



Fig. 1 – Example of a complex spinal implant that requires the use of multiple technologies in the manufacturing process

requirements. This can lead to extremely variable batch sizes, in which average-sized implants may be manufactured in batches of several hundred units, while extremely large implants are only produced in small volumes. In the past, the production of these small volumes was avoided by manufacturing extremely large sizes in batches only once every 12 or 24 months. Nowadays, however, with the latest production management toolboxes, just-in-time processes and Kanban systems (fig. 2), as well as the pressure to reduce tied-up capital, this is no longer possible.

As a world leading provider of multi-technology solutions from a single source, GF Machining Solutions offers a complete portfolio of technologies (Milling, wire-cutting EDM, die-sinking EDM, Laser processing and Laser texturing), and links these to their own automation system in a flexible production cell (fig. 3). Wherever possible, this production cell is equipped to enable the medical device product to be manufactured in a single clamping process. Depending on the demand and the degree of automation, loading and unloading can be performed in every station of the flexible production cell—either manually or in a fully automated process. This leads to a reduction in the workforce required to achieve the daily product volume.

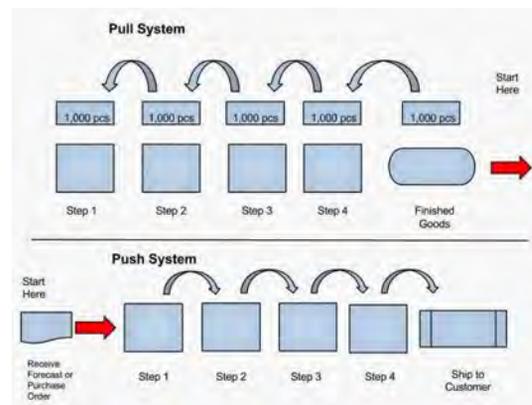


Fig. 2 – Standard Kanban production workflow



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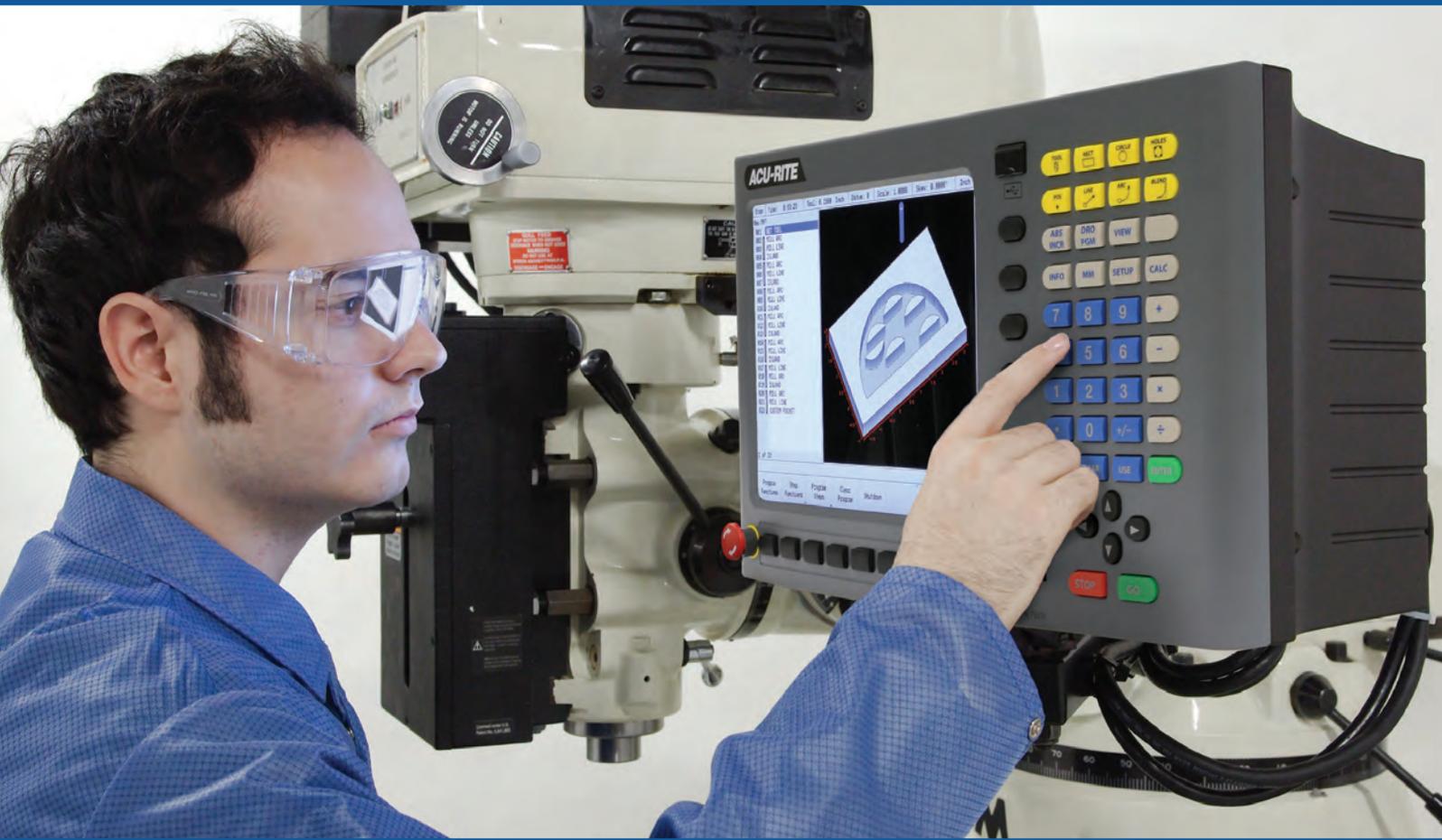


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