

CNC WEST

Volume 39 - Issue 2

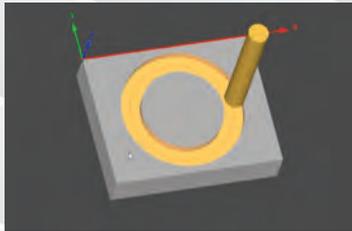
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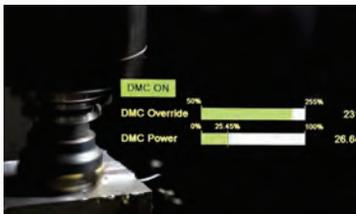
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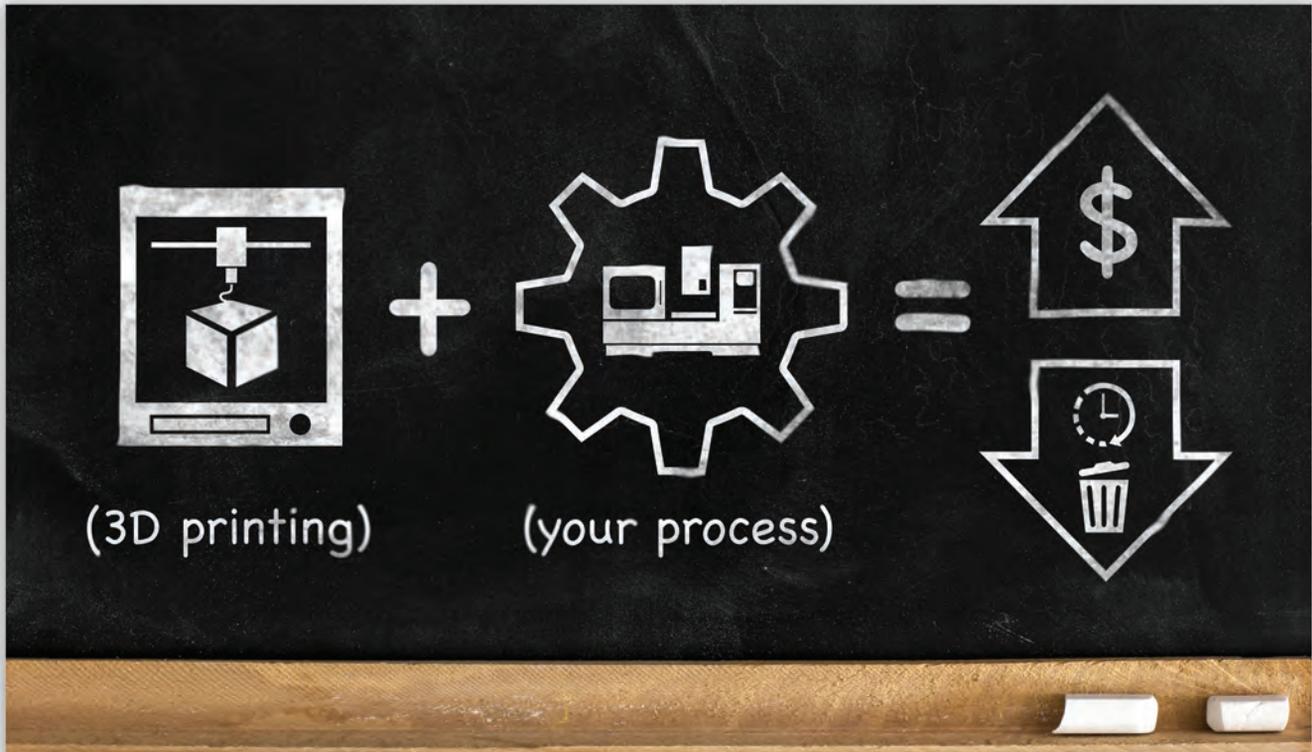
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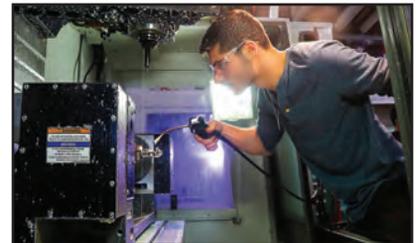
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Duonetics in Corona, Ca balances Balancing, Turning, Milling and Quality Control.Page 40



At Cal Poly SLO, experience fosters successPg.44

Coming in February/ March 2021

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, 2021

Ad Space: Jan 22, 2021

Ad Material: Feb 1, 2021



VOL. 39 NO.2
December 2020/January 2021

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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Stay The Course and Hopefully 2021 Will be Better For ALL of Us

They say what does not kill you makes you stronger. Well 2020 has made many of us pretty damn strong then. Not a whole lot of ways to sugar coat it. Covid 19 has put a hurt on most of us that is for sure. Whether it from getting sick, not being able to work, losing some business or a myriad assortment of other reasons this has not been an easy 2020 for many. CNC WEST has tried to help by offering to write an article on western region machine SHOPS and perhaps helping them drum up some business that way. A few companies have taken us up on the offer but actually much less than we expected. Offer still stands for you shops out there wanting to tell your story and maybe getting some business. Or at the minimum it could just make some of your employees day to see their picture in the magazine.

This issue closes out the year and I hope you enjoy it. Our cover article is about a Santa Ana shop that cuts mostly glass and not metal. They were sending out for inspection and were so impressed they decided to purchase the same machine the person they were farming it out to and do it themselves. It is a decision they have been happy with. Another story tells the story of a southern California shop that was looking to upgrade their turning department and a meeting with Selway Machine Tool 'turned' into an order of 6 Smart machines. Mom and Pop shops are the backbone of America, but how about a shop that has mom on one side with her own shop doing fabrication and pop on the other side of the building doing machining work. Read all about that on page 34.

Duonetics in Corona does a lot of work that most shops do plus they do balancing which is pretty unusual. It makes for an interesting read. Cal Poly SLO is considered one of the top engineering colleges in the U.S.A. They feel hands on experience is very helpful and they have a very nice machine shop where they say that experience fosters success. This along with a few other feature articles will provide you with interesting reading during your holiday break.

I honestly hope that things pick up for all of us next year. Wishing you a very Merry and safe Christmas and New Year.

Until next year,

Shawn Arnold

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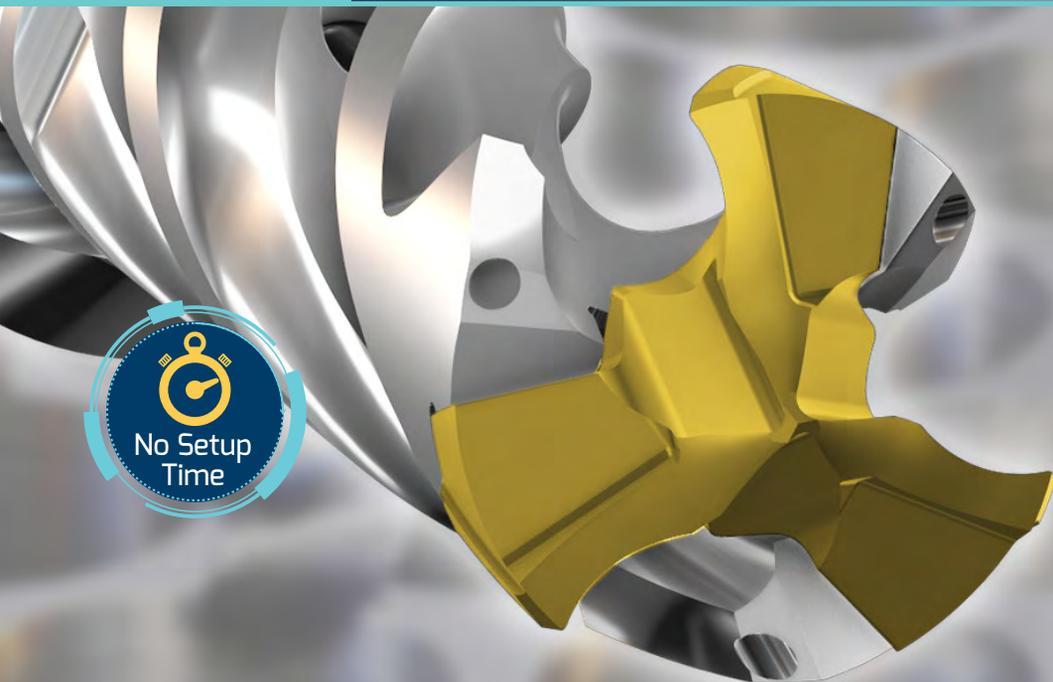
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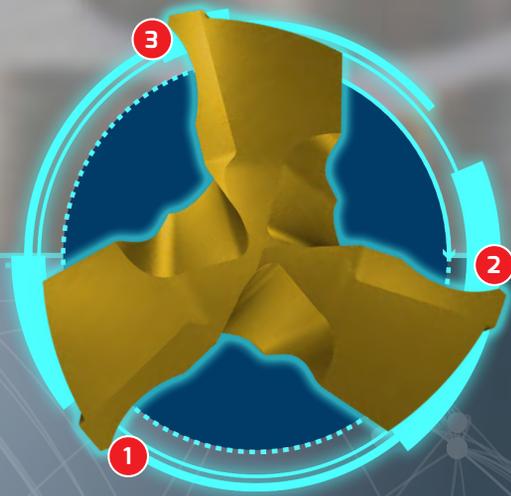


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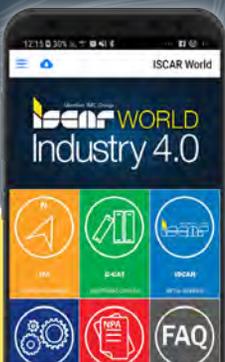
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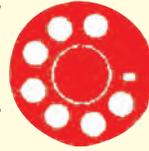
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EXEC HOTLINE



Avantus Aerospace Acquires California Screw Products

Avantus Aerospace, a global leader of C-Class and Composite parts for the aerospace and defense industry announces the acquisition of California Screw Products ("CalScrew") in Paramount, California.

CalScrew manufactures unique, high-strength fasteners for commercial and military aerospace applications and has a natural fit with other companies within the Avantus group, including FTC (Fastener Technology Corp), acquired in December 2019, and FIT (Fastener Innovation Technology), acquired in September 2020.

CalScrew's existing management teams will continue to operate and grow the business under the guidance of Fastener president Dennis Suedkamp, and director of business Development Larry Valeriano.

DynCorp Wins Potential \$352M Contract to Maintain California's Wildfire Response Aircraft Fleet

DynCorp International has received a potential five-year, \$352M contract to provide depot-level aircraft maintenance services to support the California Department of Forestry and Fire Protection's wildfire control operations

The company said in November it will help maintain CAL FIRE's fleet of 57 fixed-wing vehicles as part of the contract with a three-year base period and a pair of one-year options.

CAL FIRE's aerial firefighting platforms include S-2T air tankers, UH-1H Iroquois utility helicopters, A-200CT training aircraft, S-70i Black Hawk multimission helicopters and OV-10A Bronco turboprop aircraft

The department plans to add seven C-130H tankers to its fleet during the contract term, DynCorp added.

Services covered by the award include the manufacture, modification and repair of aircraft parts such as airframes, propellers, engines and helicopter rotating components.

Contract work will take place at McClellan Park in Sacramento.

AFRL Opens New Lab at Kirtland AFB for Deployable Space Structure Tests

The U.S. Air Force Research Laboratory (AFRL) has inaugurated a new facility at Kirtland Air Force Base in New Mexico, built to test novel deployable space structures for the service branch.

The 7,000 square foot Deployable Structures Laboratory features a secure and climate-controlled, vibration isolated area to test high-strain composite materials, USAF said.

DeSel with its specialized equipment will also be used to evaluate the repeatability and precision of spacecraft structure deployments.

"Some of the first structures that we look forward to testing in this new lab are those required for our Space Solar Power Incremental Demonstration and Research project, one of our top priority programs," Col. Eric Felt, director at AFRL's space vehicles directorate.

Northrop Lands Potential \$4.8B Air Force Global Hawk UAS Modernization IDIQ

Northrop Grumman has received a potential \$4.8B contract to update, refurbish and sustain the U.S. Air Force's fleet of RQ-4 Global Hawk unmanned aerial systems.

The indefinite-delivery/indefinite-quantity contract includes task orders for specific UAS modernization services in line with the Air Force's Global Hawk program, the Department of Defense said Wednesday.

Contract work in support of the UAS and its variants cover various activities including program management, engineering, analysis, overseas contingency operations support, fielding assistance, logistics services, facilities modification, quality assurance and requirements specification management.

The Air Force Life Cycle Management Center will obligate multiple fiscal-year appropriations for the sole-sourced award.

Northrop will perform work under the IDIQ contract in San Diego, California, through Sept. 30, 2030.

Continued on page 82...

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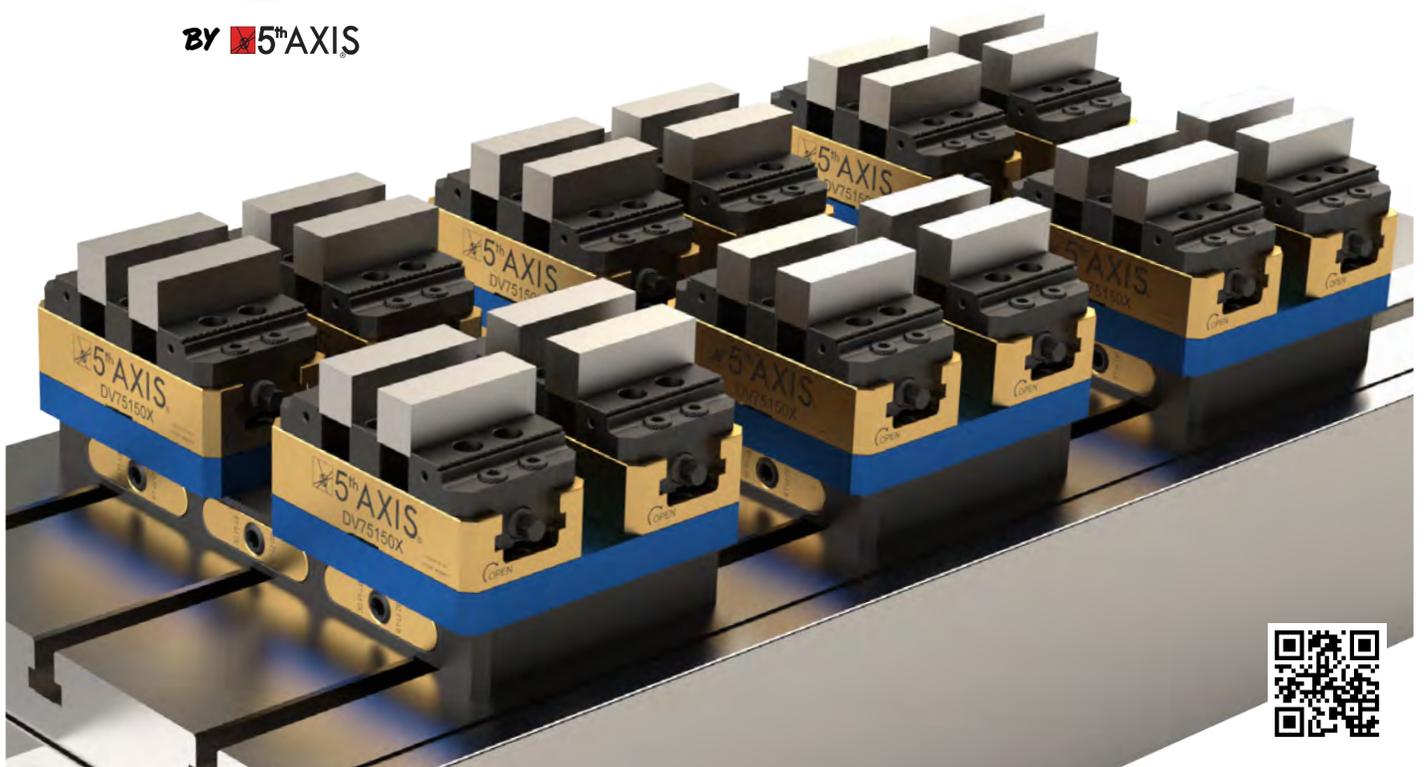
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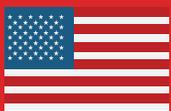
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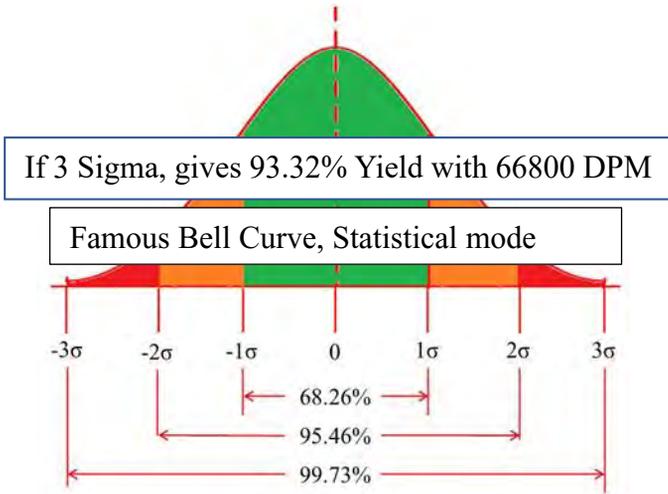
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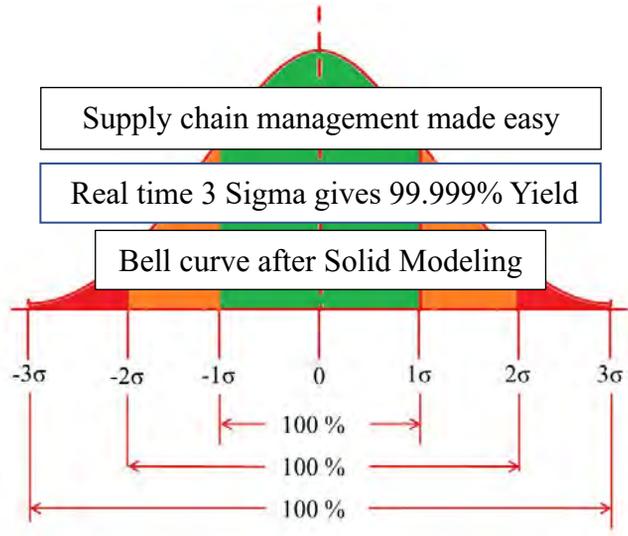
PRACTICAL SIX SIGMA FOR MACHINING PROCESS

In statistics area under Normal Curve, according to the Empirical Rule or 68-95-99 Rule, is assumed that the process is under control and normal.



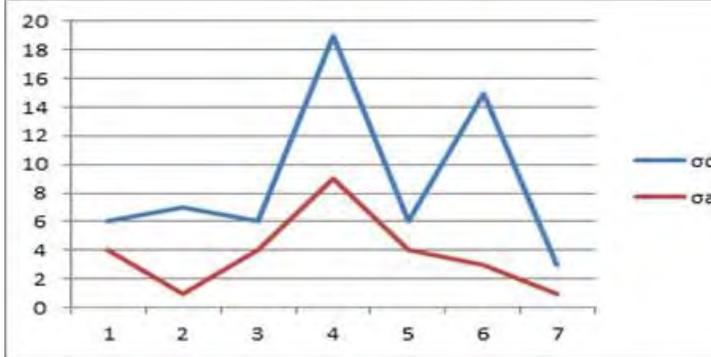
In modern technologically advanced world, this Six Sigma, an antiquated decades of old technology have proven to be very inefficient, time consuming and expensive, not to say that it is wrong way to determine the quality of a machined products & it is unreliable, not worth investing on.

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6	4
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3	4
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8"	.312	.499	3/8	1.750	2	TG-8200F	\$ 22.15	8"	RTG-8200A	\$ 103.80
					3	TG-8300F	\$ 64.44	10"	10-RTG-8300A	\$ 240.33
10"	.501	.749	1/2	2.125	2	TG-10200F	\$ 23.83	12"	12-RTG-10200A	\$ 184.94
					4	TG-10400F	\$ 75.33	15"	15-RTG-10400A	\$ 607.05
12"	.501	.749	1/2	2.500	2.5	TG-12250F	\$ 72.22	15"	15-RTG-12250A	\$ 494.11
					4	TG-12400F	\$ 102.35	18"	18-RTG-12400A	\$ 851.69
15"	.501	.749	5/8	3.000	2.5	TG-15250F	\$ 87.22	21"	21-RTG-15250A	\$ 908.09
					4	TG-15400F	\$ 113.74	24"	24-RTG-15400A	\$ 1,550.55

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

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						Part Number	Set Price	Part Number	Set Price
Kit B206 HO27M6 HS-06	6"	0.472	10MM	0.787	2	KT-6200F	\$ 34.37	KT-6200AF	\$ 31.59
					3	KT-6300F	\$ 44.99	KT-6300AF	\$ 41.12
					4	KT-6400F	\$ 95.71	KT-6400AF	\$ 86.08
Kit B208 ZA6-8 HS-08	8"	0.551	12MM	0.984	2	KT-8200F	\$ 40.70	KT-8200AF	\$ 38.56
					3	KT-8300F	\$ 46.82	KT-8300AF	\$ 50.90
Kit B210 HS-10	10"	0.630	12MM	1.181	2	KT-10200F	\$ 45.84	KT-10200AF	\$ 46.66
					4	KT-10400F	\$ 76.14	KT-10400AF	\$ 67.46
Kit B12 HS-12	12"	0.709	14MM	1.181	2	KT-12200F	\$ 72.00	KT-12200AF	\$ 74.05
					3	KT-12300F	\$ 107.96	KT-12300AF	\$ 90.10
Kit B212 BBM 315	12"	0.827	16MM	1.181	2	KT-12208F	\$ 72.00	KT-12208AF	\$ 74.05
					3	KT-12308F	\$ 107.96	KT-12308AF	\$ 90.10

*For Pointed Soft Jaws, replace the "F" with "P" & add \$4.00 (6"-10")/\$7.00 (12" & above) per set.

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Chuck Dia	Part Number	Price Each
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5"	JBR-05	\$ 162.00
6"	JBR-06	\$ 184.25
8"	JBR-08	\$ 226.48
10"	JBR-10	\$ 255.67
12"	JBR-12	\$ 284.23
15"	JBR-15	\$ 427.06

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- Plain back

Size	Thru Hole	Part Number	Mfg's List	Our Price!
6"	1.654"	BI-7866-0600	\$ 1,175.00	\$ 1,057.50
8"	2.165"	BI-7866-0800	\$ 1,285.00	\$ 1,156.50
10"	2.992"	BI-7866-1000	\$ 1,458.00	\$ 1,312.20
12"	4.055"	BI-7866-1200	\$ 2,165.00	\$ 1,948.50
16"	5.354"	BI-7866-1600	\$ 4,393.00	\$ 3,953.70



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- Designed for first operation roughing, expect runout between 0.005-0.010
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- Ground body for improved run-out
- OEM Style features ground tips
- XTRA BITE: Very aggressive bite with conical teeth for extra gripping
- For Kitagawa™, Samchully™ & other chucks

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

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\$524.00 each
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 - Straight serrations
 - For Metric tongue & groove top jaw mounting
 - For SMW-Autoblok® KNCS, Rota THW Plus, Röhmi® DURO-T & ATS Systems quick jaw change chucks



ALSO AVAILABLE!



Chuck Dia	Chuck Reference	Part Number	Set Price
6"	140/165/175/170	GBK-160-A	\$ 290.00
8"	200/210/215/225	GBK-200-A	\$ 320.00
10"	250/265/275	GBK-250-A	\$ 360.00
12"	315/340	GBK-315-A	\$ 445.00
15"	400	GBK-400-A	\$ 455.00
20"	500	GBK-500-A	\$ 915.00

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

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SPIN TRU: Balanced to 20,000 RPM @ g2.5

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ULTRA PRECISION (0.0002" TIR) COLLETS ALSO AVAILABLE!

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



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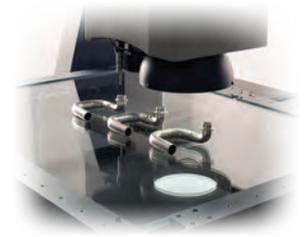
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New APDIS Laser Radar System From Nikon

Nikon Metrology launched its next-generation Laser Radar inspection system recently. This new Laser Radar, re-named APDIS (short for “Accurate Precision Distance Scanning”), offers precise, no touch measurement capabilities designed to boost quality and efficiency on automotive and other large-scale production lines.

Nikon Metrology’s Laser Radar has been at the forefront of a quiet revolution in automotive quality control, bringing high accuracy, absolute measurements to the shop floor. With over 150 installations in 36 vehicle plants worldwide, the Laser Radar has proved itself to be an invaluable tool for manufacturers to improve their quality, reduce scrap and ultimately save money.

The release of the new APDIS Laser Radar builds on this success to give the most productive Laser Radar ever built. This will drive the changes required for an automotive industry that has for many years been striving to achieve better productivity and higher overall quality.

“Laser radar’s ability to precisely measure in-line and near line applications saves time while contributing to quality improvements in the complex manufacturing process in both the automotive and aerospace industries,” said Jim Clark, president, The Americas for Nikon Metrology. “With APDIS, Nikon has delivered its most advanced laser radar yet, and the greater productivity, usability and reliability of the system will be an invaluable asset to all of our manufacturing partners.”

Greater Productivity

APDIS is capable of measuring almost any surface, providing faster measurements at just 2-3 seconds per feature to identify quality issues early on. A built-in orientation sensor allows for measurements in any orientation when robot mounted, with auto detection to load calibration data automatically. Additionally, an industry first direct surface vibration measurement capability allows installations and machines to be analyzed safely and remotely with the in-built laser technology.

Precise control over the scan path and accurate, point cloud-based feature measurements keep data sets small. Holes, slots and other sheet metal features can each be measured in a few seconds and specific surface points at several per second. Combined with fast movements between features, it enables short measurement times to be achieved. Even traditionally troublesome features such as studs can be scanned and measured rapidly without the need for adapters.

To ensure quality visuals, a new, high-definition Nikon camera coupled with new Nikon confocal optics offers better viewing of what is being inspected, helping to deliver the right data in real-time.

“The enhanced measurement productivity delivered

with APDIS offers up to 10 times faster measurement with greater precision and accuracy than conventional technologies,” said Ghassan Chamsine, vice president of engineering, for Nikon Metrology. “Ultimately, fast, accurate measurements save manufacturers product development time and production expenses.”

Greater Usability

APDIS is 40-percent lighter and 25-percent smaller than its previous generation of Laser Radar. The smaller size and a shorter range – from .5 meters (1.6-feet) – allows it to fit into tight factory spaces as well as for ease of movement around the production floor.

Another improvement over traditional technologies and previous Laser Radar systems is a rapid warmup time, cutting the warm up time to 15 minutes from power on.

Greater Reliability

By closely monitoring production quality during the early build phase, the manufacturing process can be instantly adjusted when variances occur over time, reducing the risk for flaws and costly fixes. The touchless technology offered by APDIS allows for less risk of harming parts or the Laser Radar itself, removing unnecessary line stoppages due to part collisions.

“With the precision and ease of use of the APDIS Laser Radar, there is the potential for manufacturers to detect issues sooner and thereby reduce scrap and production delays at product launch,” according to Chamsine.

Further, the APDIS scanner is sealed to protect the laser system from the dust and water often found in manufacturing facilities and meets the rigorous industry standards of IP54 (IEC 60529).

Models

APDIS is available in four models including the enhanced MV430E and MV450E editions with a 30-meter (98.4-foot) or 50-meter (164-foot) radius measuring range, respectively. These versions include “Enhanced Feature Scan” technology, offering up to double the feature measurement speed over previous laser radars. Two standard versions (MV430 and MV450) are for applications where top speed and vibration analysis are not required. Length measurement accuracies for all models range from 28 μm at 2 meters (6.56 feet) to 313 μm at 30 meters (98.4 feet). The minimum range is also shorter at 0.5 meter (1.6 feet).

“APDIS makes easier and more efficient repetitive and complex parts measurement at very close range and from a distance,” said Clark. “APDIS is ready for use in aerospace, energy, automotive and other large-scale industrial or scientific environments.”

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VISION SYSTEM ASSURES GLASS ACT AT CALIFORNIA SHOP

Article Supplied by The L.S. Starrett Company
All photos courtesy of Precision Glass & Optics

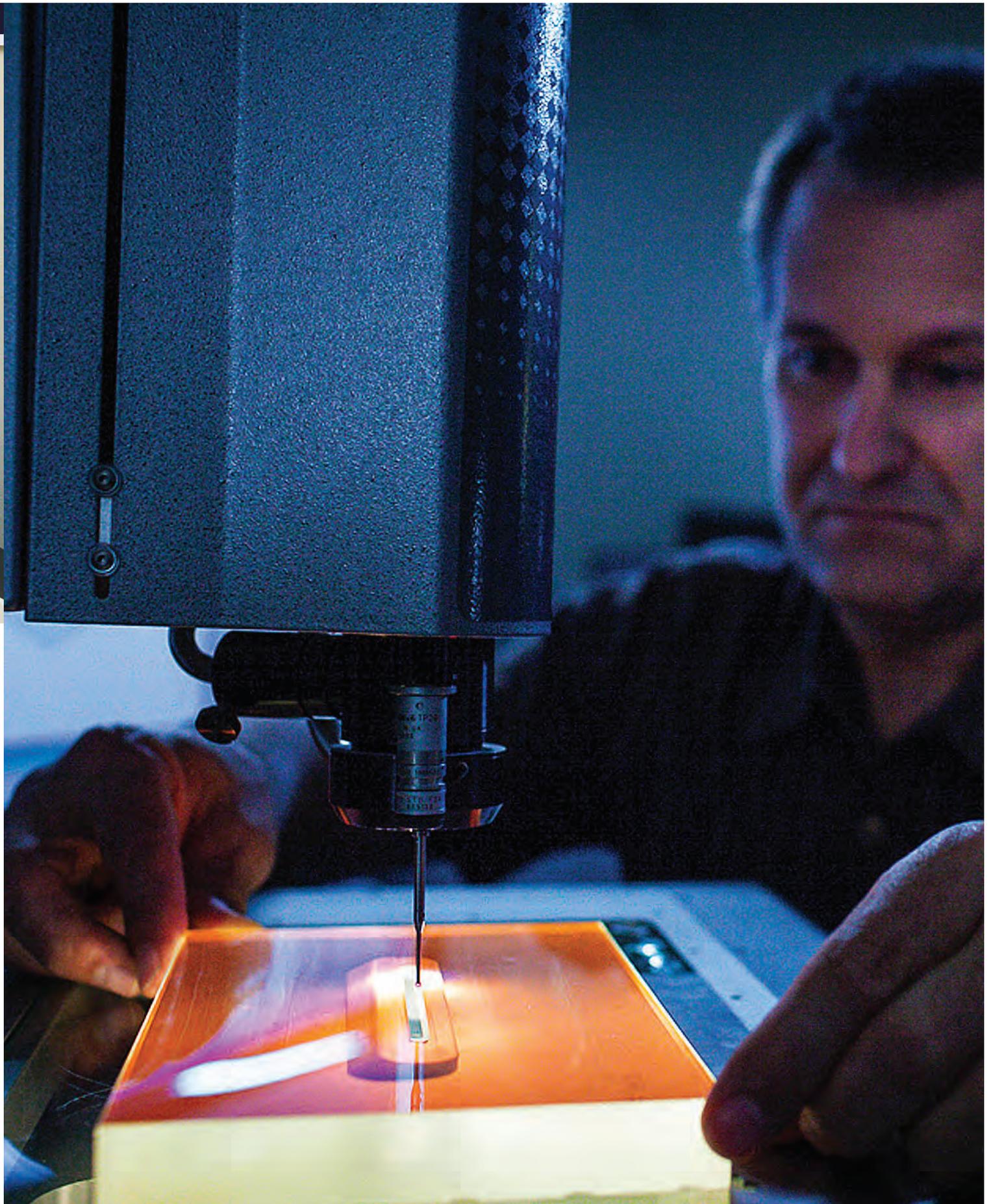
Machining metal has its challenges as many shops will attest, but machining glass is another matter – one that Dan Bukaty Jr., president of Precision Glass & Optics (PG&O) is well schooled in. Dan and his 35- person shop manufacture high-end precision glass optics for customers such as IMAX, Intuitive Surgical, Boeing and NASA, to name a few. The products PG&O make can range from the ordinary to the extraterrestrial, such as mirrors that it fabricated for the Hobby–Eberly Telescope to measure dark energy in outer space.

Operating in an 18,000 sq. ft. build-to-print optical fabrication facility in Santa Ana, CA, approximately 80 percent of the products PG&O manufactures are termed “windows”, in that light travels through them. Used for thousands of applications, they are sold worldwide to optical catalog companies or in industries such as defense, biomedical, automotive, digital cinema and more.

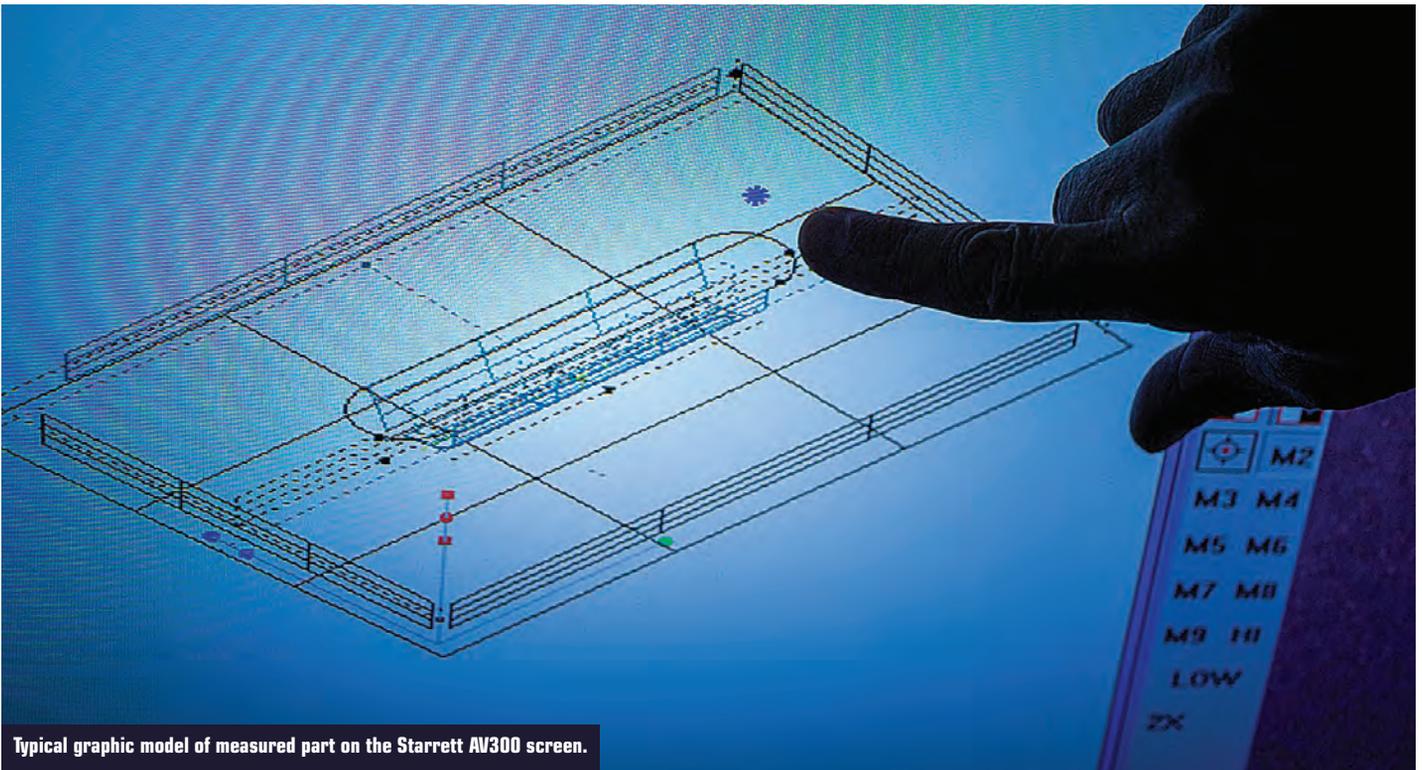
A majority of these products are also thin-film coated with advanced coatings. Before the products are precision ground on Blanchard grinders, polished and coated, they are machined and fabricated to specification on a HAAS CNC machining center or Flow Waterjet and other equipment as needed. They have a full fabrication shop, three large coating chambers and can anneal, grind, polish, drill, engrave and cut a full range of glass substrates. The company also has comprehensive design and engineering services, and full inspection capabilities.

CRYSTAL CLEAR PROBLEM

Although the plano optic products PG&O makes – prisms, laser filters, beam splitters, mirrors and more vary widely, they all have one requirement in common – the need for highly accurate measurement and quality control.



Dan at the Starrett AV300 measuring a part. "Honestly, I don't know how we got along without the Starrett AV300" -Dan Bukaty Jr., President, PG&O



Typical graphic model of measured part on the Starrett AV300 screen.

“Many of the products we make have custom shapes and profiles and are specified to tight tolerances,” explained Dan. “We measure profiles such as rectangles, diameters and ellipses to within tenths, and angles, parallelism, perpendicularity and anything in-between, to within seconds.”

To say this regimen can present challenges when measuring by conventional or rudimentary means is an understatement, and one that has tested Bukaty and his team repeatedly. On some occasions it has even driven them to farm out their inspection, which has been an expensive proposition.

Before Bukaty arrived at the most optimal solution to these challenges, their inspection protocol was clearly a pain point.

MEASURE AND RE-MEASURE

“Intricate measurements were taken either by height gages on a granite surface plate, an optical comparator or even an autocollimator for measuring angles,” said Bukaty. “The process was very time-consuming, often required math calculation and the results were unreliable. We could not achieve the accuracy we needed.” On many optical parts, PG&O needed to move the work from one operation to another, measuring and re-measuring.

“We would capture height and width measurements from a height gage and then move the part to an autocollimator or interferometer,” noted Greg Quinn, PG&O QA manager. “A part with tight tolerance angles could take hours to measure and yield either non-repeatable measurements or questionable accuracy.”

Amid all the uncertainty and time loss, PG&O discovered by serendipity the solution to its drag on quality. Pressed to inspect a complex rounded pyramidal part with four faces that needed to be accurate to 15 arc seconds, PG&O noticed that the measurement of this part which they sub-contracted to a third party vendor, were being made on a Starrett AV300 Vision System. “We later inquired about this machine ourselves and bought one within a week,” said Bukaty.

ACCURACY – THE NEW VISION

The Starrett AV300 has enabled PG&O to verify production parts quickly. “With the AV300, many if not all, attributes can be captured simultaneously, saving an enormous amount of time. The machine’s programming function allows us to insert the part, hit go and walk away. The accuracy is far superior to our previous inspection methods,” said Bukaty. “Honestly I don’t know how we got along without the AV300.”

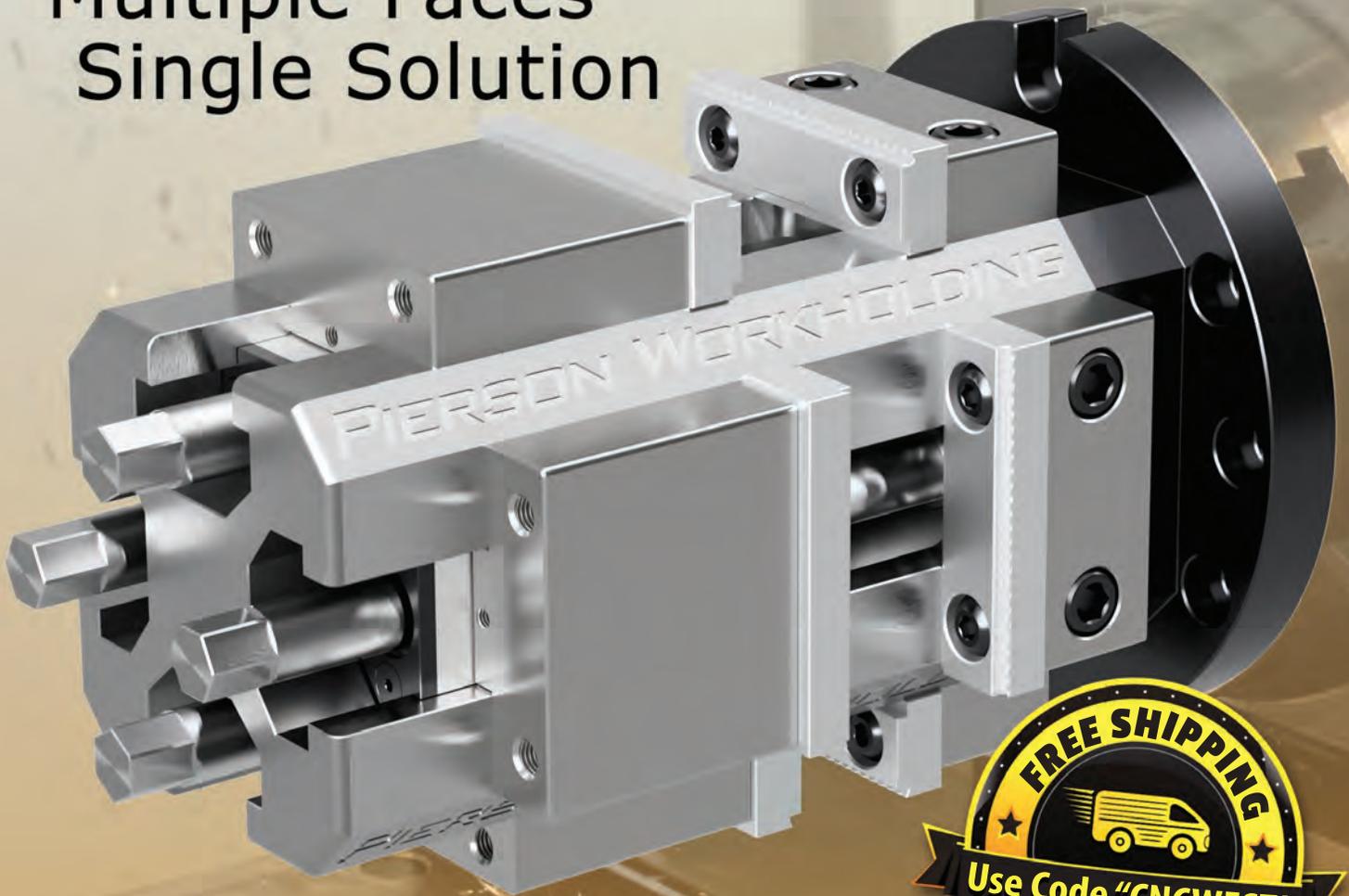
“The pre-programming CNC feature is ideal for 100% inspection on a multiple quantity order of, say 150 pieces. Once the tolerances and features of the part are measured, recorded and stored on the first piece, measurement on the other 149 pieces can be automatically repeated,” explained Quinn. “We can also print out a professional looking report for verification and our customer’s documentation requirements – something not possible with a height gage or autocollimator.”

Versatility is another advantage with the Starrett AV300 system. “Similar to a CMM, the machine can measure parts via touch probe or optically by zooming in

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on an edge or artifact, aligning with the crosshair reticle and taking the measurement manually or automatically” said Quinn, “The system is also very easy to use.”

The Starrett AV300 Automatic Vision System is as flexible as it is powerful, enabling QA personnel, inspectors or machinists to achieve maximum throughput of finished, accurate parts in their manufacturing operation. The system’s performance is enhanced by an exceptionally stable mechanical design with precision linear bearings, in addition to high-resolution video zoom optics and touch probe, that all combine to ensure accurate 3-axis measurement.

Another throughput-enhancing feature is the system software which controls all video edge detection features and multiple channel fiber optic or LED illumination. The system has a travel of 12” x 6” x 5.5” (XYZ), which is ideal for PG&O since most of its parts are 6” or under.

SHATTERING THROUGHPUT GOALS

With the vision system in place, PG&O has substantially ramped up its inspection productivity. “Our part

verification throughput has far exceeded expectations, dramatically increasing by up to 50%” said Bukaty, “This was due to fast first article inspection turnaround, as well as verification of both in-process work and even tooling,” he explained.

It was difficult for Bukaty to pinpoint any specific dollar savings derived from the AV300. Still, their initial calculations demonstrated monthly savings in the thousands through productivity gains after factoring all benefits. “We have not only realized improved part accuracy and throughput. We have also saved man hours and reduced scrapped parts while freeing up machines more quickly, which has enabled us to take on more work,” noted Bukaty. “We have also been able to reduce our lead times, which is another hidden benefit and a great selling point.”

From pain point to sales point, PG&O’s vision on inspection now appears to be 20-20.



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Laser Tech gets SMART



Southern California aftermarket automotive part manufacturer went from researching to taking delivery of 9 SMART machines in just a few weeks.

Article: Selway Productions | Photos: Laser Tech & Selway

Laser Tech opened up shop in 1989 and quickly became a leader of sheet metal fabrication in Southern California. They have since grown to occupy 70,000 sq. ft of manufacturing space in Riverside, CA and have expanded their capabilities to offer laser cutting, punching, machining, milling, turning, forming, welding, hardware insertion, assembly, and kitting. Although Laser Tech serves many industries such as Aerospace, Medical, Transportation and Commercial, they specialize in after-market automotive parts and even offer their own products through sister companies Icon Vehicle Dynamics and Ultimate MX Hauler. To keep up with the company's growth, owners, Tony DiGuglielmo and Chuck Markley, needed to increase productivity while staying competitive during the uncertain times of the 2020 COVID pandemic.

Deciding to bolster Laser Tech's CNC turning center line, Tony and Chuck started evaluating brands and comparing models. They were looking for the perfect combination of

performance, value, and quick delivery. They could have taken the easy road and added additional machines from brands already used in production, but ever the smart entrepreneurs, the two executives were willing to go outside their comfort zone to look for a competitive advantage. That's when Selway Machine Tool Co. sales representative, Brad Haugen, stepped in with the SMART product line.

"We were the underdog going in," Brad said as he recalled on the uphill battle he had with proving that the previously unknown SMART product line was a better solution than Laser Tech's existing CNC equipment. For two weeks, Selway's team ran comparative analyses for Tony and Chuck discussing the differences and benefits of the machines like higher spindle speeds and faster rapids. It finally took a trip to Selway's 40,000 sq ft facility in Ontario, CA to see the Smart demo machines on their showroom floor for the two executives to get an idea of SMART's quality.

“We felt as if we were not buying off of just a brochure or on-line pictures,” Tony explained. Working with the Selway team, they identified the SL 20L and SL 280 models as potential solutions for their immediate turning needs. These slant bed, compact lathes would fulfill Laser Tech’s need for speed with the 8” chuck, linear way SL 20L and rigidity with the 10” chuck, box way SL 280.

It’s well known that builders need to be price competitive in the saturated 2-axis, 8” and 10” chuck lathe market and SMART was no exception. They came with aggressive pricing and offered a 2-year factory warranty to boot. However, more important to Tony and Chuck was the local service and applications support Selway would provide to Laser Tech. “The number one reason for purchasing was the confidence we have in Selway Machine Tool for support and service. They stand behind the equipment they sell,” said Tony. Within 2 weeks of their first meeting with Selway, Laser Tech purchased (4) SL 20L and (2) SL 280 lathes and 11 days later they had machines on their shop floor.



Selway Applications training Laser Tech CNC operators.

With a quick install and excellent training by Selway’s Application Engineers, Laser Tech’s skilled operators had their new machines up and running in no time at all. “These guys know their stuff,” stated Selway AE, Lance Paul, “and the SMART machines are very intuitive to run.” After a few weeks of successfully running parts on their 2-axis SL Series lathes, Tony was confident turning to Selway and SMART again to add more machining capacity. Working with the Selway applications team to reduce cycle times further, they chose to go with (3) SL 280M turn/mill centers. The SL 280M delivered C-axis and live tooling capabilities on a platform they were already familiar with saving valuable set up time, decreasing the error of part handling, and shortening the operator training curve.



Laser Tech’s SMART Machine, Part, & Icon Vehicle Dynamics Brand

By the last day of training, Laser Tech was making automotive shock absorber parts and other aftermarket automotive products on their new machines. Tony and Chuck’s willingness to investigate and eventually invest in a new CNC brand and dealer relationship, turned out to be a SMART decision. “Selway has a great team. I am confident in saying that everyone at Selway has made this the best buying experience we have had. Communication was outstanding from sales, the office staff and all the technicians. We have zero complaints. We are very happy!,” stated Tony.



NIMS Celebrates 25th Anniversary, Launches New Smart Solutions

NIMS (The National Institute for Metalworking Skills), established in 1995, is marking its 25th anniversary in 2020 with fresh, forward-thinking methodologies for skills training, performance validation, and credentialing that address the competencies needed by today's technology-driven manufacturers. "Manufacturing operations have automation and digital systems in place today that weren't even concepts 25 years ago," said Montez King, executive director of NIMS. "As such, the skills required and the ways in which those skills are taught and measured are changing as well, both on the job and at educational institutions. NIMS is uniquely positioned, after 25 years in industry and career and technical education, to be at the forefront of this effort."

NIMS was founded in 1995 as a non-profit organization with the mission to develop and maintain a globally competitive American workforce. Over the last 25 years, the organization has become the industry standard for skills training, validation, and credentialing, providing now over 60 portable credentials in specific technical areas. The organization also is instrumental in developing industry standards that NIMS credentialing candidates are tested against, giving employers confidence in end-performance of any potential employee with a NIMS validated credential. In keeping with the revolutionary, "smart" digital transformation occurring in industry with its new advanced technology roles for employees, NIMS has kept pace with this rapid change by revamping its mission's approach. The organization has developed new Smart Standards, Smart Training Principles, and Smart Performance Measures as the three main pillars of its effective framework.

Elaborating briefly on each, Smart Standards are highly customized, yet are also standardized and recognized by industry. They enable proper training for employees in manufacturing where technology is developing and changing faster than an average individual can master in their career span. They reveal job roles and adapt to ever-changing technology and workforce requirements. Smart Training Principles are the guiding parameters to establish a quality, highly customized on-the-job training program that reveals true performance validation and a praiseworthy investment return for companies. Smart Performance Measures properly define, validate, and benchmark employee performance, along with the communication mechanisms needed among all stakeholders in a community: Organizations, trainers, and trainees. They measure performance of each stake-



holder and reveal end performance, which provides clarity, transparency, and unification of the applied learning.

Further, just as flexibility is one of the hallmarks in today's manufacturing environments, so too is this new approach that allows manufacturing companies and educational institutions to establish agile, dynamic training programs that can keep up with the rapidity of technology adoption. To help employers assess their own OJT (on the job) training programs, NIMS offers a free evaluation survey on their website for employers to use.

NIMS has launched new standards and credentials in recent months based on the new Smart Standards framework, such as Dimensional Measurement and Machining, which features new roles in CAM Programming and 5-Axis CNC Machining. Very soon the organization – partnering with Festo Corporation – will introduce Industry 4.0 standards that will culminate in a portable credential for employees and students by the fall. Essentially, the "new NIMS" is an Industry 4.0 network, but in the world of training and certification.

"Gone are the days of conformance to a one-size-fits-all training and workforce development paradigm. As schools and companies brought their challenges to us, we had to develop solutions, and those solutions had to align to 'smart' manufacturing and Industry 4.0," said King. "With the leap in technology and its application in manufacturing over the last 25 years, and the new initiatives at NIMS to meet those skills challenges, I'm confident we will be celebrating our 50th anniversary in 2045!"

For more information, contact NIMS at (703) 352-4971, www.nims-skills.org.

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FARO portable CMMs with Verisurf Application Suites offer highly accurate and powerful inspection and reverse engineering tool-sets that are easy to learn and operate, using quick three-step workflow processes.

Verisurf Software has supported every FARO portable metrology device since its first industrial articulated arm in 1995, and the first FARO Laser Tracker SI introduced in 2002. Verisurf continues this commitment of support, today, by announcing enhanced software features for all FARO portable arms. By configuring any new or existing FARO portable CMM with Verisurf 2020 software, customers will realize immediate performance gains, over standard configured devices, including expanded capabilities, productivity features, and universal compatibility with other CMMs in use.

Verisurf software driving FARO portable arms deliver rapid 3D inspection and reverse engineering that enables machine shops to increase efficiency, improve part quality, and reduce scrap. The integrated solution delivers automated ‘in-process’ inspection right to the shop floor, providing first article inspection and reporting in minutes.

“One powerful differentiator that sets Verisurf apart from other measurement software is Model-Based Definition (MBD). Verisurf is built on a CAD platform and can open, read, and modify virtually any intelligent CAD file, including the ability to edit or add GD&T datums. This is extremely important in maintaining digital continuity and supporting downstream applications in today’s manufacturing 4.0 landscape,” said Ernie Husted, president and CEO of Verisurf.

Verisurf and FARO continue to close the loop in digital manufacturing workflow. Manufacturers can not only

Rapid Three-Step Inspection

1. **Align:** Align manufactured part to 3D CAD model by probing part to corresponding alignment targets on 3D CAD model.
2. **Inspect:** Inspect manufactured part in real time by probing any surface or by following repeatable automated inspection plans.
3. **Report:** Report inspection results in industry standard formats with intelligent GD&T and color deviation maps for clear, practical analysis.

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Verisurf universal compatibility makes FARO devices, and all other CMMs across the manufacturing enterprise, software independent. By selecting Verisurf as a single open measurement and inspection platform, shops can easily access any CAD file and drive virtually all portable and fixed CMMs, sharing inspection plans, collecting measurement data, creating quality reports, or reverse engineering whole parts or features into intelligent 3D CAD models.

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ELLIPTICAL SYSTEMS LLC AND HYPERFORMANCE PRODUCTS INC.

Article by Sean Buur Photos by Sean Buur & Travis Watson



MOM SHOP + POP SHOP = ONE STOP SHOP FOR CUSTOMERS



David Rippe & Michelle Tiscareno-Rippe

Mom and pop shops are a staple of America. All across the land husbands and wives work side by side through thick and thin. Times of thick are great, but when thin comes to town it isn't always ideal having all your eggs in one basket. Michelle Tiscareno-Rippe and David Rippe have found a solution, mom and pop diversification. To most, diversification means spreading out the customer base between multiple industries, but to Michelle and David it means having mom's shop, Elliptical Systems LLC and pop's shop, Hyperformance Products Inc. The two separate companies cohabitate a 5,500sq.ft. industrial unit in Huntington Beach, CA. Manufacturing is split nearly down the middle with the sheet metal business (Elliptical Systems) on one side and David's performance machined parts, fasteners and accessories (Hyperformance Products) on the other. It all adds up to a one stop shop for customers.

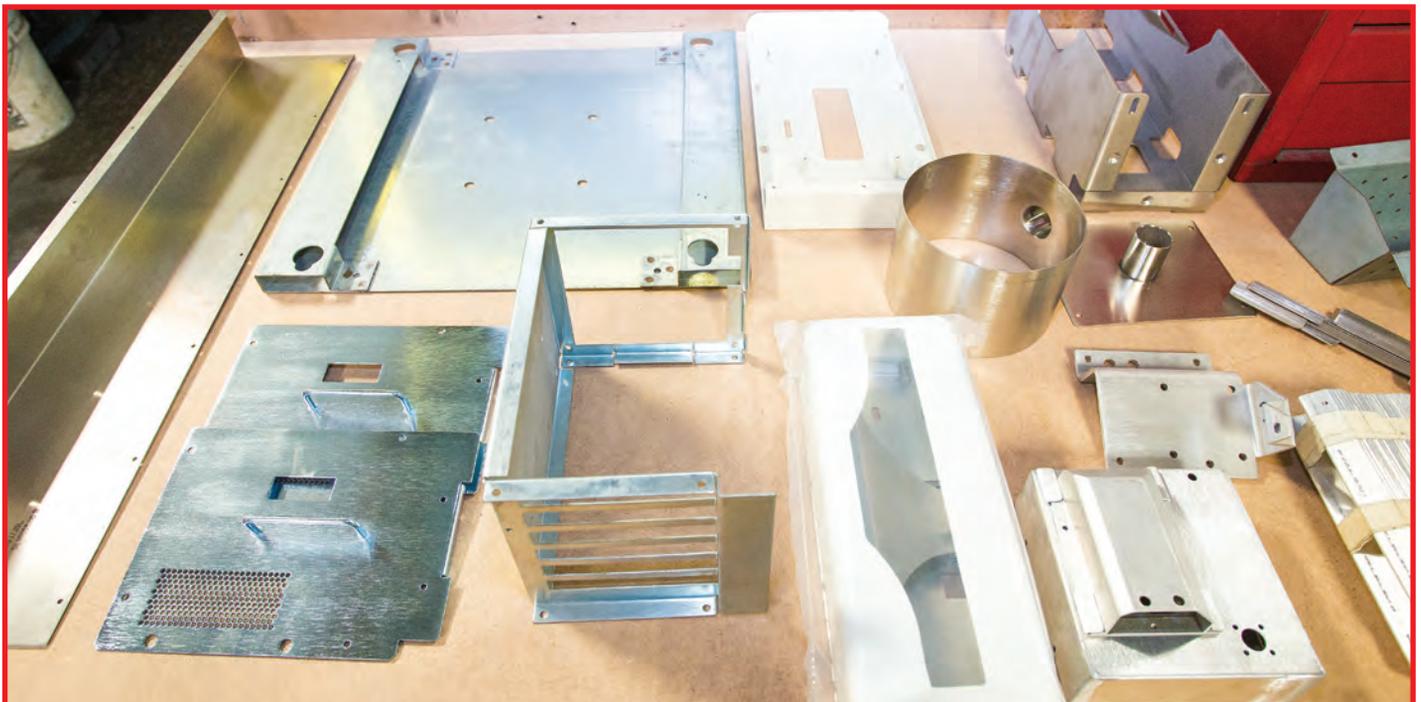
Customers come to Elliptical Systems for help with their sheet metal manufacturing needs because they offer a wide variety of services. Michelle started off by helping David assemble parts, did shipping and receiving, running parts on his lathe and learning how they operate. She found what he was doing interesting and liked seeing the parts he was making. That led her asking a



Michelle Tiscareno-Rippe & Elliptical Systems LLC relies on Amada CNC turret punches and Haco and Wysong CNC press brakes for all their sheet metal needs.

lot of questions and educating herself over the years. An opportunity arose to buy Elliptical Systems. It came with a customer base already established. By fostering the relationships and building a stronger client base she was able to generate enough new orders to justify purchasing her own equipment. Michelle has spent the last five years growing the business well beyond its original capabilities. "Since adding in-house manufacturing I have the ability to take a piece of sheet metal, punch it out into the desired shape, bend it and assemble it," tells Michelle. "Ultimately, the customer gets the quality made parts

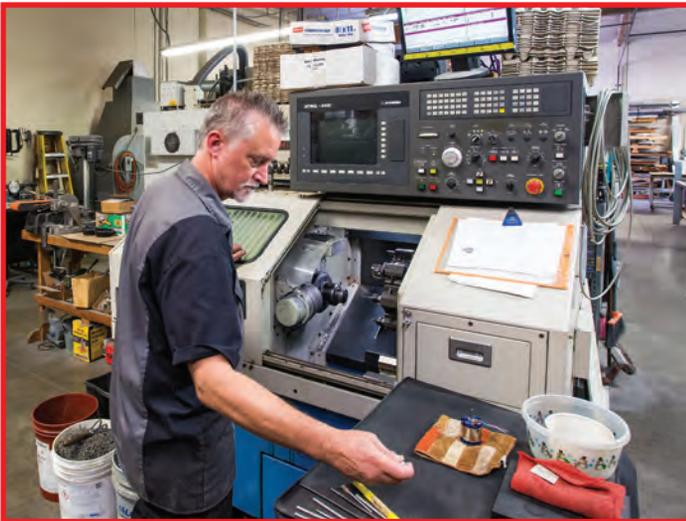
they need. There is a great feeling when the parts go from raw material to assembly ready. It's manufacturing at its best." Elliptical Systems serves industries in medical, ophthalmology, aircraft, computer, electronics and more. They strive to offer quality products at competitive prices. From prototype to production Elliptical Systems goal is to understand customers wants and help them achieve the outcome they need by working with them closely. "The majority of parts we fabricate are brackets, plates, panels, housing, chassis and more," continues Michelle. "Also, we offer certified tig welding, line grain finish and hardware



From prototype parts to production runs Elliptical Systems LLC has the in house ability to support your sheet metal needs from start to finish.



Hyperformance Products makes quite a few heatsinks for the marine industry which keeps them very busy.



David bought his first tabletop lathe to make RC Boat parts 25+ years ago.



Hyperformance Products has their own product lines of boats and accessories.

installation. Recently I dedicated space to customers that need to store parts so they can have them readily available. It's our way of accommodating customers and adding value. I have plans for Elliptical Systems to grow by improving on our systems and continually providing quality sheet metal parts on time with amazing customer service."

Elliptical Systems recently hit a milestone that was on Michelle's to do list for a long time. "I am so excited that we are now a certified woman owned small business," touts Michelle. "I am so proud to be a part of this program and look forward to the opportunities on offer. I work a lot with manufacturers that support having women and minority owned businesses. Competition is tough. Even with the customers I already have the certification puts me in a better position to earn their work. We manufacture a variety of different types of panels, plates, housings, and a tremendous number of brackets." Materials most often used are steel, stainless, aluminum, and galvanized. Elliptical Systems does it best to keep as many of the processes in-house which helps to pass on the savings to customers. "It all gets punched, bent, welded and assembled right here in HB," adds Michelle.

The pop shop part of this duo originated from David Rippe, president of Hyperformance Products Inc.'s hobby of RC boat racing. David started making boats, but quickly turned the craft into a CNC machine shop. He realized his interest and talent was in fabricating parts. "I'd go out and race and break things," explains David. "If I didn't break something then maybe I had an idea of how I could improve on product that I was already using. The business just evolved from there. I bought a small tabletop

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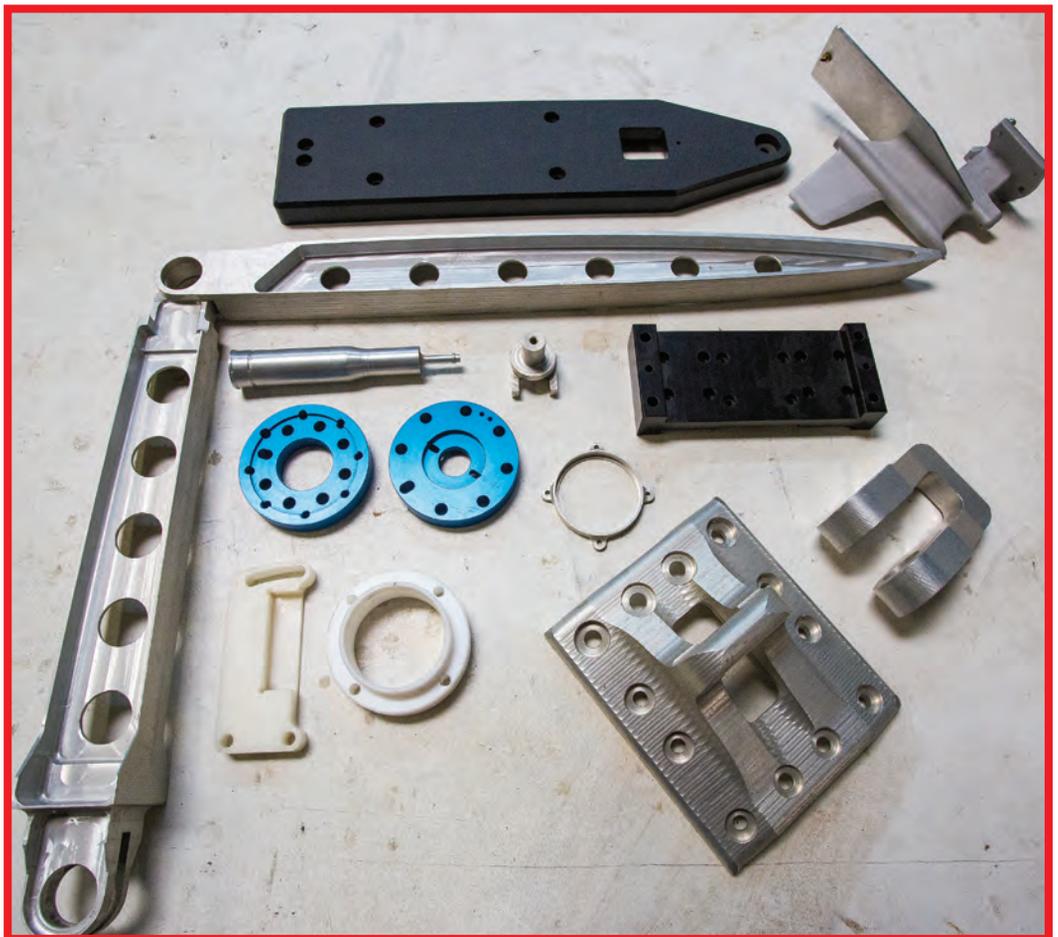
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lathe and a drill press and began making my own parts. Manufacturers started asking if I could machine parts for them. I couldn't do it all on manual machines, so I bought my first CNC machine. The main industries we serve are automotive, retail, aircraft and commercial. However, we manufacture parts in all industries needing CNC machining as well as having our own RC product lines." David's talent is that he enjoys taking a piece of metal and shaping it into something intricate and beautiful. "I taught myself how to CNC program, buying more and larger machines to keep up with the demand. I never thought RC boat parts would turn into tier 3 manufacturing for some of the biggest names in aerospace and other industries, but our quality is fantastic, and our service is unbeatable." When customers receive their parts, they are amazed at how Hyperformance Products was able to take their design and bring it to life with great precision and detail. Hyperformance Products goals are built on customer satisfaction by producing well-made parts. David built his business on recommendations from satisfied customers. It is what has kept him in business for over 25 years. It hasn't come easy; David continually educates himself and is always working to improve. He enjoys making parts that are challenging and prides himself on meeting that challenge. To further increase Hyperformance Products quality and commitment David plans to get ISO certification in 2021.

Keeping the customer satisfied is paramount and something Michelle and David both channel their efforts into. Sometimes it is as simple as making the best possible part and other times it means working through the night to get their parts out quicker. "What makes Elliptical Systems LLC and Hyperformance Products Inc. stand out is we are a "One Stop Shop" for all industries who have metal manufacturing needs," details Michelle. "We are two businesses, married, and working together in manufacturing under one roof. Together we have 30 + years of metalworking experience. We develop a relationship with customers to understand their needs. We help them achieve the

outcome they are looking for by working with them directly and offering our expertise. We are always improving our quality, our service, our communication with clients."

Working closely as a team, Michelle and David leverage the capabilities of each of their companies to best satisfy their customers. "Customers can get everything they need in one place," adds David. "Only having to go to one location adds real value. Between the two shops we have a wide variety of machines and capabilities including: certified tig/mig welding, Haas CNC mills, Hyundai and TMW Microstar lathes, Amada CNC turret punches, Haco and Wysong CNC press brakes, assembly, and a ton of support equipment. Both our companies work with clients from prototype to production. We like starting on the ground floor with customers. It really helps us understand them as a company and gives us valuable insight on how we can best assist in their endeavor. Knowing what their goal is and helping them achieve that goal keeps them coming back project after project."



For more than 25 years Hyperformance Products Inc. has manufactured quality parts for the automotive, textiles, aerospace, aircraft, hobby and marine industries.



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DUONETICS CORPORATION

**GETTING
THE
BALANCE
RIGHT
FOR 57
YEARS**



All of Duonetics Corporation's balancing equipment are American made Hofmann brand balancers. They can balance parts ranging from mere ounces up to 1500lbs of rotating weight.

Duonetics Corporation of Corona, Ca. originally came online as balancing shop in Los Angeles. It was the brainchild of Charles A. Pernice who leveraged his experience into building a business that would thrive for decades to come. Charles was a flight engineer on B29 bombers in WWII and in training to be

a fighter pilot before the war ended. He was also a veteran of the Air National Guard, having served on the east coast as an aircraft mechanic that included Presidential Aircraft during the Eisenhower administration. After his service Charles cut his teeth selling electronic balancing vibration analysis machines on the East coast, before moving his family west. "My dad got tired of the cold New York winters, packed us up and started a new career in California," tells Robert J. Pernice, Duonetics Corporation's second-generation president. "He worked for a company out here that revolved around balancing, so when he set out on his own in 1963 balancing was at the forefront of the operation. Fifty-seven years later it still plays an important part in what we do."

Charles saw the need for a company offering balancing services to the aerospace and their related industries. He also recognized that the level of precision needed required top of the line machine tools to support the high-tech balancing customers. "We always believed in having the best machine tools," continues Robert. "I started sweeping floors when I was ten years old and have run every machine to come through these doors. Originally,



Robert runs one of the first CNC machining centers they ever purchased a Nakamura Tome lathe. It still runs to this day week in and week out.

Robert does most of the 5 axis programming and utilizes Open Mind Hypermill to get the most out of the DMGs. Open Mind Hypermill advanced CAD/CAM programming software is designed specifically for complex 5 axis work including spiral inducers, turbo expander wheels, turbine wheels and blades, and other challenging geometries. Hypermill provides an array of highly diversified programming solutions saving Duonetics time and allows them to provide much higher quality and shorter lead times.



the mills and lathes were just used to create fixtures, tooling and things of that nature, but through the years we have evolved into a high-tech job shop with extensive capabilities that include balancing.”

When balancing a part accuracy is critical, in fact it is the foundation of balancing. There is no fudging precision when a part is designed to spin at thousands of RPMs. A balanced part rotates on a center line. If there is a little warp or the fixture isn't perfectly aligned the part is running eccentric when you balance it and you can't do a good job. Actually, you do a poor job and will make it worse than when you got it. “When a customer brings in a part for balancing our first step is to figure out the best way to fixture it for optimum accuracy and precision,” explains Robert. “Most parts are straight forward, but when it isn't, the customer relies on our near 60 years of experience. Parasitic mass is something that frequently comes into play in precision balancing. In other words, it is the tail wagging the dog. You have a part that weighs 3 ounces, but the balancing arbor can't outweigh the part

by a factor of multiples. Otherwise, the amount of mass that you are trying to analyze is overcome by the weight of the tooling. With 6 balancing machines on our floor, we can efficiently process parts weighing just a few ounces up to 1500 pounds of rotating weight. Our equipment is all American made Hofmann brand balancers. Hofmanns are acknowledged as some of the best in the industry for their accuracy and reliability. Each machine is calibrated to aerospace standards to maintain accuracy and controlled by our AS9100 QMS.”

Duonetics Corporation operates “lean & mean” with 7500sq.ft. of manufacturing space at their disposal. Five full time employees split duties between the mills, lathes, balancing, programming and QC. Everyone is cross trained, giving the company an agility rarely seen in shops this size. “We are very well equipped and highly maneuverable,” touts Robert. “The diversity of our equipment gives us nimbleness and adaptability to tackle nearly anything. We have everything from the basic saw up to the most sophisticated 5 axis machining equipment



Jorge Pallares (QC Manager) verifies the larger complex parts utilizing the Hexagon Manufacturing Intelligence Romer arm and smaller items on the Starrett CMM.

money can buy, a DMG Mori DMU85. We have turning centers with live tooling and Y axis, 3, 4 and 5 axis milling machines. Our machines are larger than most shops of our size. We can pretty much handle anything you throw at us up to about 3' in diameter."

Duonetics' extensive milling department is made up of the best names in the industry like Kitamura, Yama Seiki and DMG Mori. The stars of the show are their two DMG Mori 5 axis milling centers. Their first one was purchased about ten years ago, a DMG DMU60 Monoblock. Robert liked it so much that he added a DMG 85 Monoblock a few years later. Both DMGs offer 18,000 RPM ceramic bearing spindles, Renishaw or Heidenhein on-machine probing systems, Blum lasers for tool life management, and they have self-calibration. Sitting next to the DMGs is a Kitamura Mycenter H300 4 axis palletized horizontal with 100 tool capacity and two Yama Seiki BM850 vertical milling centers with 4th axis capabilities. Duonetics' turning department includes a brand new DMG-Mori NLX 3000/700, to go along with their Nakamura Tome Slant 1, Nakamura Tome TMC II, and a DMG CTX 510 with live tooling for production work. They also have a variety of support equipment including welding, honing, and laser engraving. "Everything that gets balanced has to be manufactured, and what we've found over the years

is that having the ability to do complex parts feeds the balancing business and vice versa," details Robert. "They complement each other perfectly. A customer might come to us for a balancing job and not realize that we also have 5 axis capabilities. Being able to handle everything internally and hand them back a machined, balanced, assembled part is a huge value for customers."

Duonetics Corporation has a wide range of customers in a variety of industries. If it requires precision made complex parts, exotic materials, or both; chances are they have it covered. "We run the gamut when it comes to our customer base," tells Robert. "Anything from general commercial to aerospace and everything in between. Oil & gas, chemical, pumping, automotive. We have a variety of parts on the Saleen S7 production road car as well as their race car. Of course, our roots are steeped in aerospace, so much of what we do falls under that category with customers like GE Aviation and Lockheed Martin. We are AS9100 RevD certified and just got re-certified with zero findings." Duonetics has an incredibly low defect record with their customers. Most of the parts they machine are extremely high value components; scrap is rare as a result of their inspection equipment and practices. "We are very proud of our inspection lab," continues Robert. "We take quality seriously and it shows. Our customers know our



Jose Abarca (Lathe Dept. Lead Machinist) begins his setup on the newest machine tool in the shop a DMG-Mori NLX 3000/700.

reputation for quality, and they keep coming back for good reason. We utilize a Starrett CMM and a portable laser scanning Romer Arm to insure everything is up to spec and NIST traceable.”

“There is no limit to what this shop can make,” concludes Robert. “Duonetics is not a turning house, not a milling house, not a balancing house, we are all those and much much more. I hate to classify what it is we do, but I guess

high precision job shop would fit the bill. We have really advanced capabilities that other shops typically don’t. For our size it would be hard to find a company with similar attributes and technology. Because of our skillset and equipment we take on a lot of work that others don’t want to mess with. When a customer comes in our door, they can be 100% confident that we are going to deliver exactly what they asked for, if not better.”



Al Duenas (Milling Dept. Lead Machinist) polishes and assembles parts for Jetinetics after getting the milled parts back from being anodized.



Jetinetics is an in house product line for personal watercraft racers and enthusiasts. It started in the 80's with Robert's love of jet skiing.

“LEARN BY DOING”

EXPERIENCE FOSTERS SUCCESS AT NATION’S TOP UNIVERSITY ENGINEERING PROGRAM

Article & Photos Supplied by Lynn Gorman Communications LLC

There are few universities anywhere in the United States better qualified to turn out successful engineers than California Polytechnic State University (Cal Poly) in San Luis Obispo, CA. Cal Poly’s College of Engineering, which comprises roughly 6,000 students, was ranked the eighth best undergraduate program in the country in 2019, according to U.S. News & World Report. The annual guide to America’s Best Colleges named the college’s Industrial & Manufacturing Engineering (IME) department number one in the nation. The guiding philosophy of the IME program is “learn by doing,” which aims to make students sound, practicing engineers from the moment they graduate.

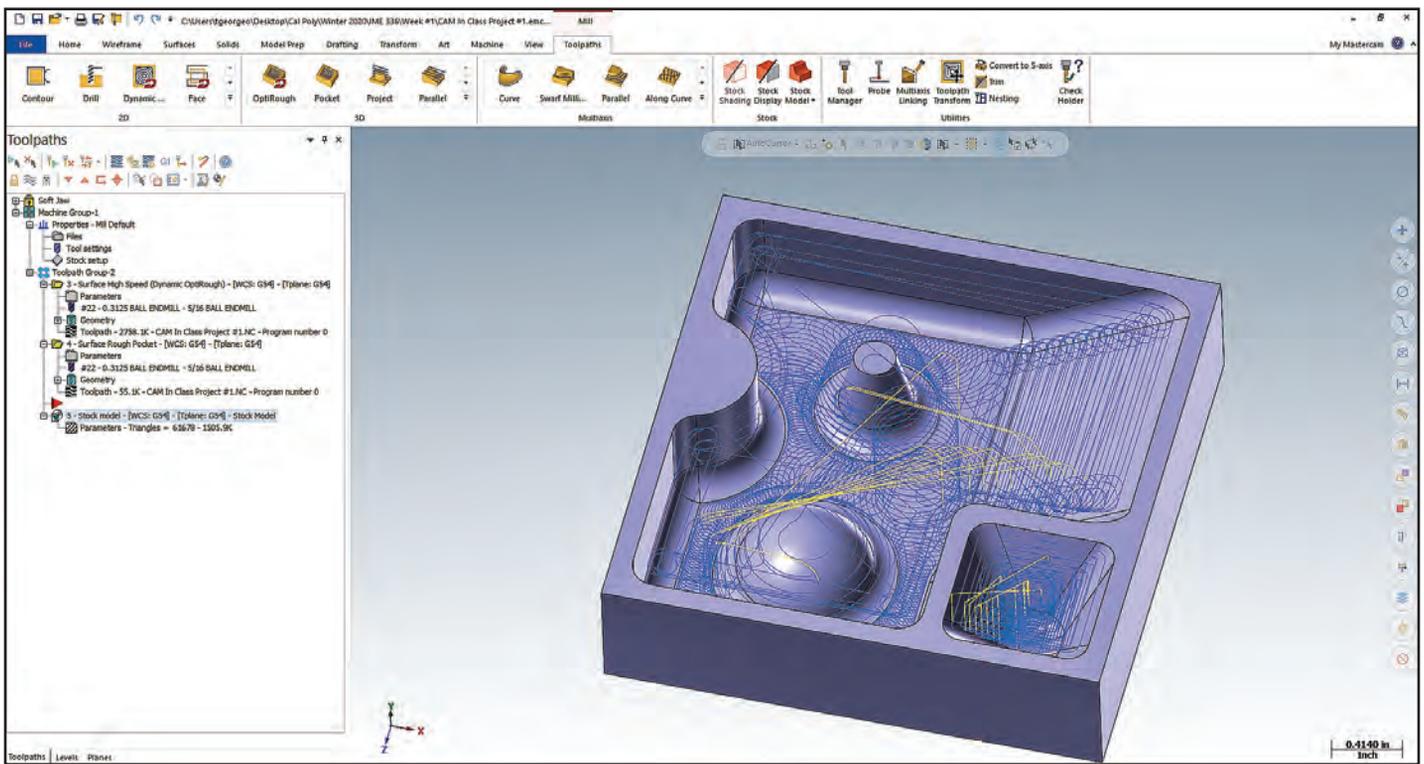
The university’s emphasis on laboratory learning attracted Trian Georgeou, manufacturing engineering lecturer, to Cal Poly in 2014 – and away from a teaching position at his alma mater Arizona State University. Georgeou taught CAD and CNC machining classes as a graduate teaching assistant at ASU and later spent another eight years in the mechanical engineering technology program after gaining practical CAD/CAM

work experience in the automotive and motorsports industries.

“Cal-Poly is really all about hands-on learning. Every machining class has a three-hour lab component,” said Georgeou. “We immerse the students in lab situations that will parallel what they’re going to see out in industry.”

Georgeou is in charge of the freshman level introductory machining courses – designing the curriculum and lab projects and hiring lecturers for the labs. He also teaches several advanced level IME courses: Computer-Aided Manufacturing, which features training in Mastercam® CAD/CAM software (CNC Software, Tolland, CT); Computer Integrated Manufacturing including multi-axis work and macro programming; and Tooling Design, which has students design machine injection molds as well as CNC fixtures for the machines.

“Cal Poly believes that every engineer should be exposed to manufacturing. Every freshman engineering student, whether they’re aerospace, materials engineering, manufacturing engineering, industrial, mechanical, or even general engineering, has to take a CNC machining



Mold dynamic tool path.

course,” said Georgeou, who estimates some 700 students go through the freshman machining lab each year in total. Cal Poly students pursuing a mechanical engineering degree (the largest program in the College of Engineering) with a concentration in manufacturing are required to take six upper level manufacturing engineering courses.

Cal Poly’s “learn by doing” philosophy is reflected in the curriculum’s large number of design-centered laboratories. The IME program features 15 lab facilities including the Gene Haas Advanced Manufacturing Lab for upper level manufacturing engineering and mechanical engineering students, a material removal/machining lab, a metrology lab, a net-shape casting lab, a welding lab, and two CAD/CAM labs with 24 seats of Mastercam 2020 each. The Gene Haas Lab contains a Haas tool room lathe, Haas ST 20 Y-axis lathe with live tooling, three Haas VF-2 vertical machining centers, six Haas simulators, and a rare Haas ZM-1 laser machining center. The freshman Material Removal Lab includes several manual LeBlond lathes alongside seven Haas CNC Mini-Mills, a Haas ST-10 turning center, a Morgan Press injection molding machine, a Universal laser cutter, and an Omax ProtoMax water jet.

“My opinion is that a manufacturing engineer should be able to do technician-level functions as well as engineering level functions on top of that. So, I start off by teaching students how to be technicians,” said Georgeou. “In freshman-level courses, students are measuring, squaring up vises, getting everything set up almost like a technician would. If they skip that step, they’re not going

to be a good engineer; they’re not going to understand all the little mechanics necessary to get a quality product out the door.”

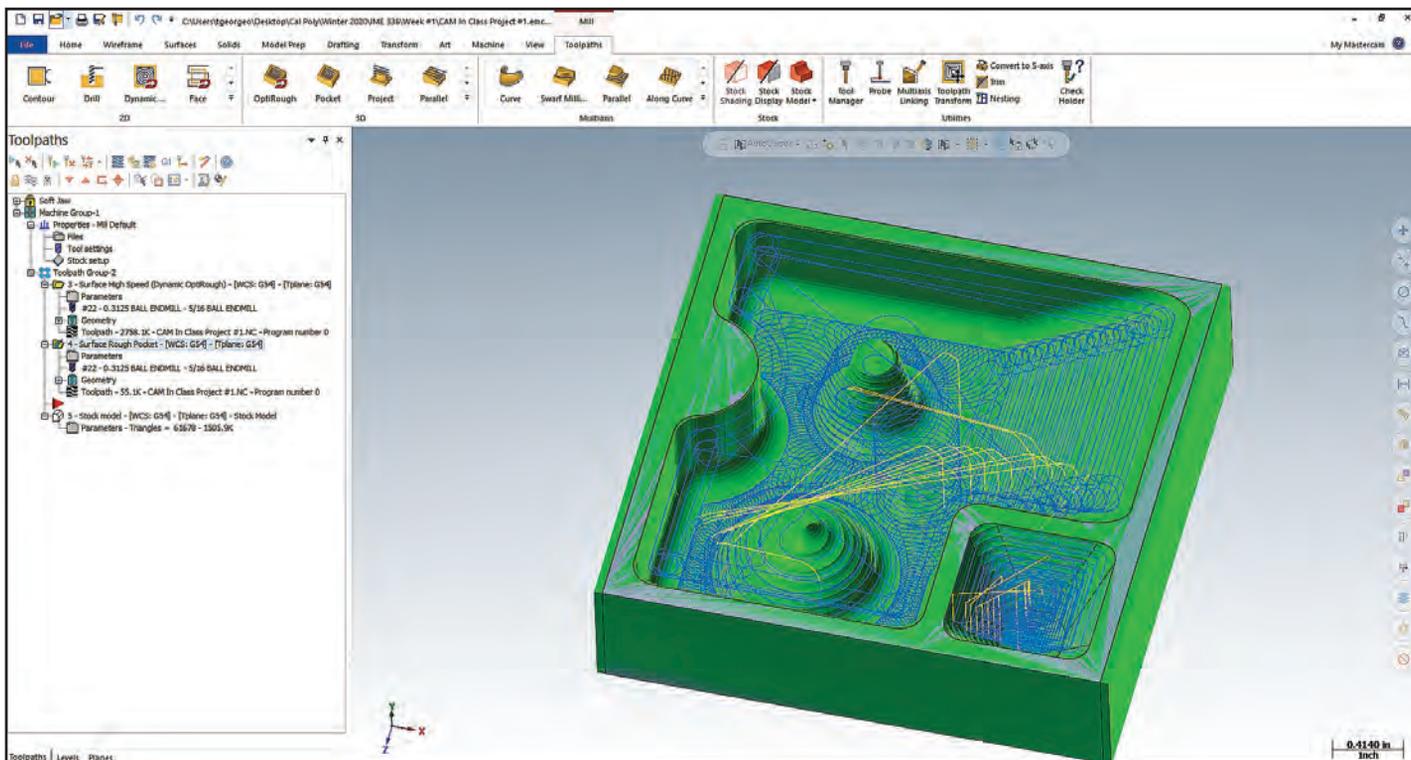
Similarly, advanced engineering students take their solid models and drawings into the lab, program, set up the machine tools, and machine their part designs so they can see how their designs actually get made.

“They’ll see, for example, that an end mill can’t cut a square corner looking from the top down, and they’ll come to understand what the capabilities of the different machining processes are in design,” explained Georgeou. “We’re not training machinists, but we are training engineers who understand the principles of design-for-manufacturability (DFM) and build that into their engineering skill set. Ideally, this will help them be better designers so that they aren’t making bad design decisions when they’re working for real customers.

“We have about 100 percent placement for our manufacturing engineering graduates because everyone wants engineers with practical hands-on experience as opposed to those that just learned theory in their university programs,” said Georgeou.

That “real world” practicality extends to the choice in CAD/CAM software.

“I selected Mastercam because it’s the number one tech CAM software in the world and we want our engineers to basically see what they’ll see out in industry. We want them to have a robust CAM package that can tackle all their machining needs,” said Georgeou.



Mold stock model dynamic tool path.

“I would say Mastercam is more robust than any other CAM system. When we get into multiaxis machining, the other systems don’t have as many different toolpaths to get the job done. When you look at the jobs that these manufacturing and mechanical engineering students are going after, they commonly list Mastercam experience as a job requirement.”

Upper level IME students first learn manual programming, formatting G-code and writing a simple program. They tackle Mastercam as well as SOLIDWORKS next when they are challenged to produce a customized CNC business card holder.

Manufacturing engineering major, Nina Menon, intended to major in mechanical engineering at Cal Poly, but became immersed in the IME department after learning about different manufacturing processes. She used Mastercam to make the personalized business card holder in Georgeou’s Intro to CNC Machining class, IME 335.

“I really like Mastercam. I struggled when I first learned to use it, but once I became accustomed to the layout and process of making toolpaths, it was really intuitive to use,” said Menon. “I enjoy learning how different parts are made and why certain processes are used.”

Upper-level students are next introduced to lathe programming and the main toolpaths needed to program simple 2-axis lathe parts. From there, students are taught how to use all the 3-axis toolpaths for a sample mold project featuring an inverted pyramid, a ramp surface,

and a spherical radius.

“I have students figure out how to improve the process somehow by making a better surface finish or perhaps achieving a better cycle time. It’s really up to the student to figure out which tools are going to be most beneficial and economical to make that mold,” said Georgeou.

The next class, IME 336, then moves into more multiaxis work. “We have a small 3+1 positioning part. Students have to locate their coordinate system on the center of rotation and figure out how to index the part by pointing the Z upward to the tool orientation based on the right-hand rule,” Georgeou said. “They’ll go through and cut a simple 3+1 part, then a 3+2 with a trunnion that they make in Mastercam. It’s a widget part but it has seven different faces and has to be produced in one workholding on the trunnion.”

The classes culminate with students designing a small impeller wheel with five sand blades, a part that is difficult to machine, using the various 5-axis toolpaths to cut different blade shapes.

“Our belief is that students should know about all the different types of toolpaths and they should be able to put together in their mind how to get a part done efficiently using those tools or toolpaths,” said Georgeou. “Students made fun of my impeller last year and called it the shower knob. So, it’s kind of become a competition between the students to design a better impeller wheel after they learn how the 5-axis toolpaths work.”

While freshmen aren’t typically working with the



Turning forward
to the Future

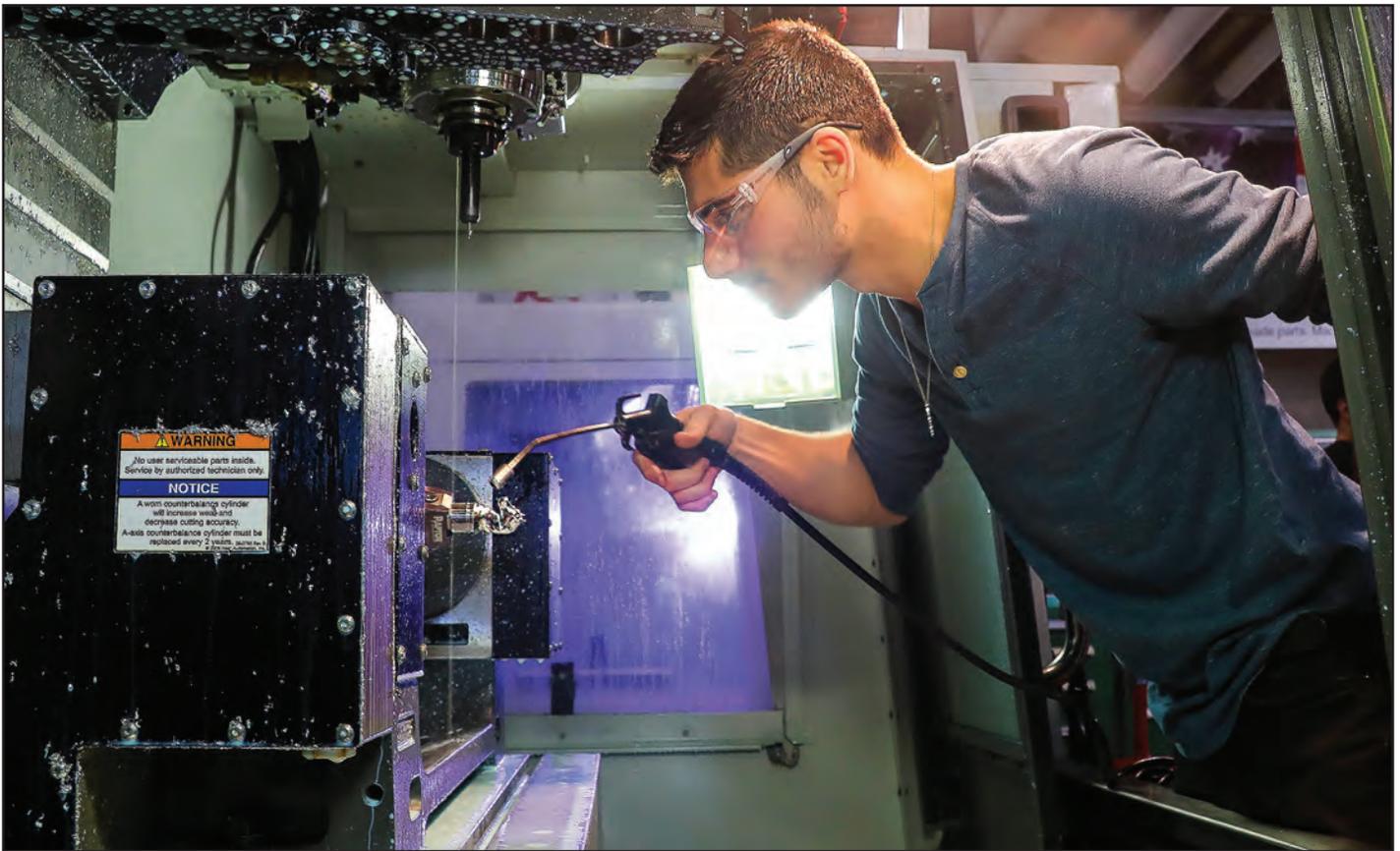
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Emad Haddad, a fifth-year manufacturing engineering major, who works in the Haas Advanced Manufacturing Lab helping beginning students operate CNC machines and designing projects for the advanced CNC programming class

software, Georgeou noted that in one of the introductory level classes, students use Mastercam Art with the Haas machines to design their own pattern for casting. With Mastercam Art's visualization tools and editing features, students can create sculpted parts from 2D sketches, clip art, photos, and CAD files by crafting them onscreen and cutting them with specialized toolpaths. No surface modeling expertise is required.

"Students cut out their patterns using Mastercam Art to create the toolpaths, machine a wax pattern, and use the wax pattern to make the sand mold in order to cast custom coasters," explained Georgeou.

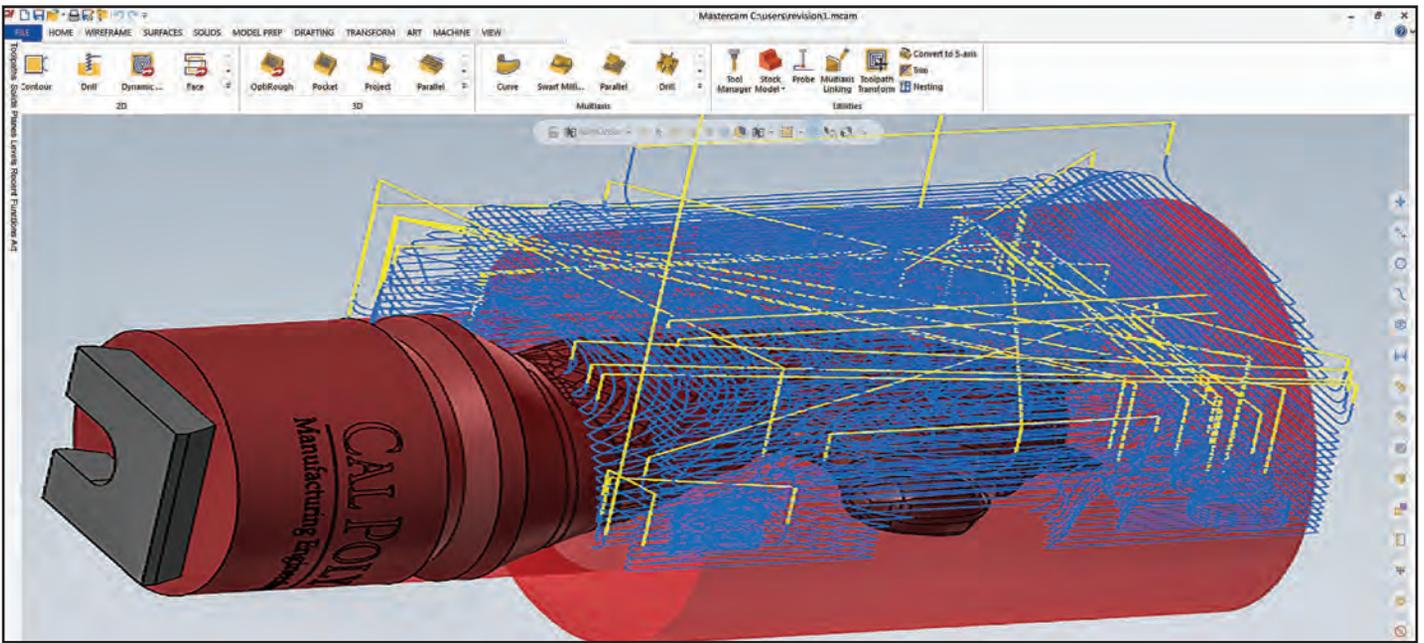
A \$40,000 working scholarship from the Gene Haas Foundation funds an "earn by doing" incentive that complements Cal Poly's "learn by doing" approach. The grant supports student lab technicians like Emad Haddad, a fifth-year manufacturing engineering major, who works in the Haas Advanced Manufacturing Lab helping beginning students operate CNC machines and designing projects for the advanced CNC programming class. Haddad recently interned as an R&D manufacturing engineer at IAG Performance, an automotive company that designs and creates aftermarket parts specifically for Subaru vehicles. There, he was involved in redesigning, prototyping, and machining a tensioner bracket for the timing belt assembly for a Subaru WRX, a part that will eventually be mass produced, according to Haddad.

Haddad is one student who improved on Georgeou's impeller project last year, using multi-axis machining and advanced Mastercam to design a more sophisticated piece with complex geometry. Haddad also showcased his creativity and the manufacturing capabilities at Cal Poly by using Mastercam to create a completely 3D horse's head to represent the school's mascot, the Cal Poly Mustang, on a 5-axis Haas machine, an achievement that gained the attention of potential employer SpaceX.

"This was a much more advanced project than anything I'd done. I watched the 5-axis programming videos that Mastercam makes available and that taught me how to control the toolpaths," said Haddad. "Mastercam is so vast in what you can do with it and much easier than the alternatives. I have much more control with Mastercam, and I can customize how things cut, which is harder to do with the other programs.

"The engineering program at Cal Poly is phenomenal. No other school that I know of has this amount of technology and access to working with 5-axis machines. Other schools are still on manual machines," said Haddad, who grew up with a love of creating and building things. "They teach you both a trade at Cal Poly and they teach you the engineering piece of it. Your first or second day as a freshman, you're already on a machine."

Menon concurred, "I think the IME department does a good job of listening to the students and improving



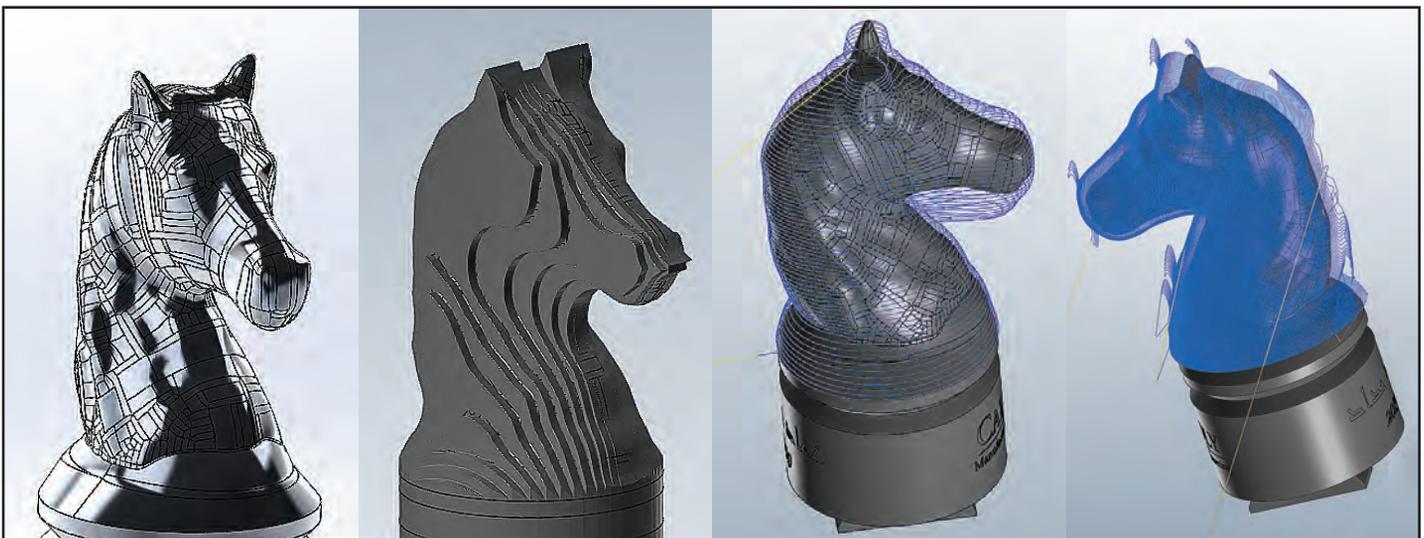
Roughing.

courses based on student needs and industry trends. The machining sequence in particular is really well-structured.”

Cal Poly engineering graduates are regularly recruited by high-profile companies such as Lockheed Martin, Boeing, Apple, and Tesla Motors, and it’s no wonder. The university’s industrial partners say they specifically seek out Cal Poly graduates because they are able to “hit the ground running.” Cal Poly’s “learn by doing” is paying dividends for the talented students who embrace the top-tier program – and for the employers who open their doors to them.

COVID-19 UPDATE: On March 19, 2020, California Governor Gavin Newsom issued a Shelter-in-Place order requiring all “non-essential” businesses and institutions

as defined by the U.S. Department of Homeland Security’s list of Critical Infrastructure sectors to either close or modify their work practices, this included colleges and universities. According to Triam Georgeou, the manufacturing engineering department adapted by video recording all of the machining processes as demos for the students to view. Subsequently, these same videos were featured in discussion sessions via Zoom. As for teaching CAD and CAM, “we are able to show the students how to model and program parts using live Zoom meetings with screen share along with some external Camtasia videos,” said Georgeou. “We are not able to have the students in the lab to run their actual parts, so we have to rely on the simulation side of Mastercam to determine if they programmed it correctly.” Georgeou, as well as his students, hope to be back to hands-on learning in the fall.



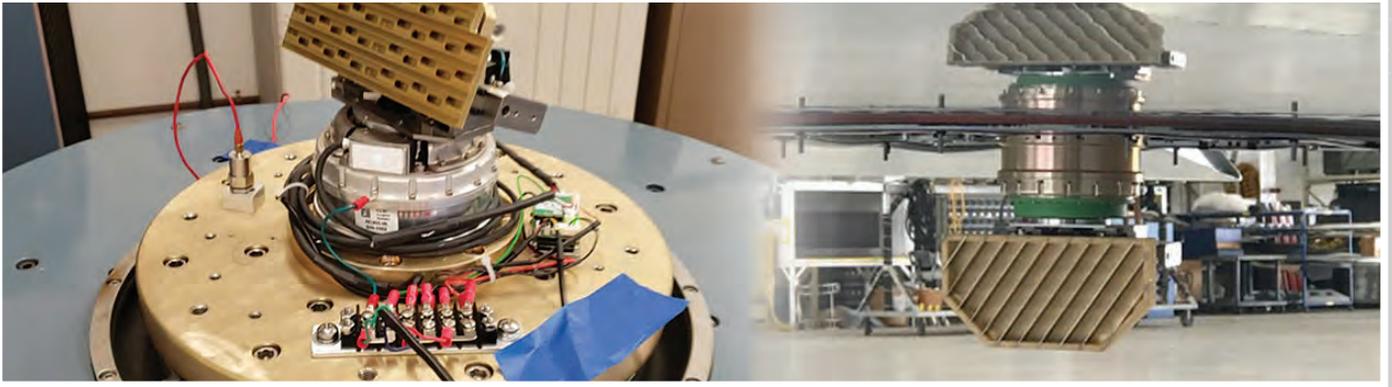
Billet model.

Post roughing.

Pre finish.

Finish.

RESOLUTE™ ENCODERS MAKE RF ANTENNA POSITIONING ACCURACY AND RESOLUTION BETTER FOR CALIFORNIA COMPANY



PAS antenna gimbal assembly on a shock and vibration test stand gen2.

California based Pacific Antenna Systems (PAS) designs, fabricates and manufactures state-of-the-art antenna systems that use radio frequencies (RF) ranging from 1–110 GHz. Applications include high-resolution radar, high-rate data communications for line-of-sight and satellite (SATCOM) communications, and high-power microwave systems for drone (UAS) countermeasures.

The basic principle of an antenna is the accurate positioning of an RF beam on a target. PAS utilizes several different electro-mechanical designs for its antennas, depending on the application. Rotary position encoders are installed on each motion axis (gimbal) to provide the required precision and accuracy.

In airborne systems, challenging environmental conditions such as sub-zero temperatures, RF noise and high mechanical vibration complicate the task of finding a suitable encoder. Previous PAS antenna systems suffered from encoder performance issues such as lower accuracy, poor RF interference immunity (RFI) and vibration rejection. Renishaw encoder products have enabled PAS to improve the positioning accuracy and resolution of its servo control loops by over two orders of magnitude.

CHALLENGES

Radar and RF communications systems for airborne applications need to be light-weight, compact and powerful. These systems must also be modular and easy to assemble. Anthony J. Macri, vice president of PAS, explains how this impacts design: “We use the acronym: Size, Weight and Power (SWAP). For everything we do on the airborne radar and the comms side, SWAP is an extremely important parameter. For us, the challenge is to put a beam on a target. We use very tight beams in our RF systems, especially in the millimeter (mm) wavelength regime. Beam spread can be as low as several hundredths of a degree at W-band (95 GHz). When we mount the antenna on a platform, there is an error budget for the

navigation data. If the accuracy and resolution of the gimbal encoders is poor, then the RSS pointing error of a system will increase and we will be unable to find the target.”

PAS airborne communication systems are vital for the high-data rate communications of aircraft such as NASA’s WB57 research plane. The encoder on each gimbal must function at altitudes of over 40,000 ft and at temperatures below -40 F. High rotational speeds and accelerations are also essential in order to allow fast beam pointing and scanning operations. Encoders are critical components in communications and radar applications and need to be highly reliable, as a failure could potentially endanger lives.

SOLUTION

PAS uses different gimbal designs for its monostatic radar and comms systems, but they all use the RESOLUTE absolute optical encoder with BiSS-C serial protocol and 26-bit or 32-bit resolution options. “We exclusively use RESOLUTE encoders in our radar products, the line-of-sight and SATCOM antennas and high-power microwave products. We have chosen these encoders for their high accuracy and high resolution, which we can use in our control loops. We’ve flown them on UH60 Blackhawk helicopters, as part of the collision avoidance radar, and the vibration environment on a Blackhawk is extremely challenging. We noticed that the RESOLUTE encoders were highly immune to vibration. If the encoder were to oscillate and lose count, then the control loop would be compromised. RESOLUTE encoders provide us with the level of accuracy and robustness that we need,” says Mr Macri.

PAS monostatic radar systems feature a stack-up of components that include the RF array feed at the bottom, and a series of lenses mounted on two-axis gimbals and powered by a direct-drive motor. Each motor is mechanically coupled to a RESOLUTE Extended

Temperature Range (ETR) encoder with a 75 mm D-section RESA ring scale for feedback control of the lens rotation.

“The encoders are offset and coupled directly to the drive, as the motors are very small. A motor has a rotor and a stator component, so what we do is couple the ring to the rotor component. As the motor starts to spin, it accurately rotates the ring with respect to the encoder readhead, which is placed outside the entire mechanism. The beauty of the radar application is that the RF energy propagates in free space through the bore of each motor,” adds Mr Macri.

The RF comms systems are of an analogous design but feature more traditional slip rings, rotary joints and coaxial media. In this case, the open bore of Renishaw’s RESA ring provides the space and functionality needed at the top end of each rotation axis.

RESULTS

Renishaw’s RESOLUTE ETR encoder with BiSS-C protocol has enabled PAS to design and build cutting-edge antenna systems for a wide range of applications. Mr. Macri highlights the benefits of choosing the RESOLUTE encoder for antenna systems: “There are many things that we really like about RESOLUTE: ease of use, high accuracy and resolution, and reliability and suitability for challenging environments. During assembly, our technicians manually align the encoder readhead using

a feeler gauge and it doesn’t take much to align them. Also, the RESOLUTE encoder’s advanced diagnostic and setup tools help to quickly resolve any problems. PAS is using the BiSS-C serial protocol for the encoder signal output, because it’s open architecture, easy to use and fast. Importantly, it features a high number of safety cyclic redundancy check (CRC) bits. So, you know if there is a problem. When you look at a life cycle situation, being able to get the product built quickly, effectively and have it fielded reliably is critical. RESOLUTE encoders enable us to do this.”

In PAS radar systems, lenses spin at over 7000 degrees/sec and accelerate at greater than 40,000 degrees/sec². Due to their unique single-track design, RESOLUTE encoders enable very high resolutions at high velocities. This performance affords PAS radar systems market-leading measurement accuracy of the target position. “We use 32-bit encoders and we truncate down to about 18-bits. What’s great for us is that the accuracy number and the LSBs (Least Significant Bit) of the resolution are extremely close. The accuracy and resolution, when the encoder is set-up as 18-bit BiSS, mesh perfectly. We need repeatability within a thousandth of a degree. We must test all components on these assemblies due to the significant nature of the applications. RESOLUTE more than exceeds our requirements,” concludes Mr Macri.



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CNC Indexing & Feeding Technologies Names Erik Bergman as President

CNC Indexing & Feeding Technologies has appointed Erik Bergman as president. Mr. Bergman is responsible for continuing to build a nationwide distributor network for the company's extensive line of Ganro and TJR rotary tables and indexers, CNC Indexing's own high pressure coolant units, and TRACER bar feeders and loaders. He will work closely with leading machine tool OEMs, industrial distributors, and machine tool dealers to grow sales and market share.

Mr. Bergman has an extensive background in both the machine tool and accessories sectors and the product and sales engineering expertise to help end users and distributors find the right solution. Mr. Bergman's prior experiences include Superior Spindle Service, WTO, Chip Blasters, SETCO, and Technical Equipment in Cleveland, Ohio.

Starrag North America, True Analytics Manufacturing Solutions

Starrag and True Analytics Manufacturing Solutions (TAMS) have entered a business agreement to include TAMS RevolutionCore™ software on Starrag machines.

As a result, Starrag North America customers, especially those that run expensive, complex parts and small lot sizes, will be able to understand every detail of the process.

"The impressive part of True Analytics is that its Industrial Internet of Things (IIoT) product is designed around the idea of process monitoring, which is not the same as machine monitoring," said Udo Herbes, Starrag managing director in the U.S. "The difference is that traditional machine monitoring generalizes something very complex into simple metrics, such as overall equipment effectiveness (OEE) and manufacturers can lose valuable details. Process monitoring embraces the complexity and gives the manufacturer very specific and incredibly detailed information on the best way to make improvements to overall productivity."

Starrag has implemented the RevolutionCore software on several machines it has delivered to customers across North America. "Process monitoring provides a manufacturer a very clear roadmap on how to make improvements, whereas machine monitoring provides managers generalized metrics but very little insight into how to actually improve," said John Murphy chief technology officer at True Analytics.

RevolutionCore software interfaces are comprehensive and are designed around a specific plan on how the manufacturer wants to enrich the machine data with data from other systems.

For example, if a machine is running at 75% utilization and 55% efficiency it's important to know what that part is, the material, what the tool in the spindle is and how has that tool performed in the past on a similar part and similar material.



Mitsui Seiki Launches New Interactive Website Featuring Industry Tech Exchange

Mitsui Seiki USA, Inc. has overhauled its U.S. website to be more interactive, and relevant to the entire manufacturing sector. The company has developed a "Tech Exchange" leading from its home page at www.mitsuisseiki.com. "The idea was to establish an online place where industry professionals can post and exchange technical information regarding a wide range of manufacturing processes and general industry information about various economic markets, industry events, and the like," said Bill Malanche, Mitsui Seiki's COO. "We've initiated a few conversation starters there at the launch, and we look forward to many users engaging and starting their own topic threads." Establishing an account is required and Mitsui Seiki personnel will be monitoring the commentary.

In addition to the innovative Tech Exchange, the company also has a "Watch" feature on its home page which will be an area for new staff-inspired video clips relayed in a casual, personal way. For more formal presentations, "Events & Webinars" is also a new home page feature, which currently features Mitsui Seiki USA

Industry News

chairman Scott Walker giving an IMTS Spark presentation on “Questions to Ask Before Buying a Machine Tool”. A “Chat Now” button is also prominent on the home page for quick access to a Mitsui Seiki USA support expert.

The new website also hosts the company’s product line data in HMCs, VMCs, jig borers, jig grinders, thread grinders, and specialty machinery.

Takumi USA Is First to Offer Renishaw Set & Inspect Probing for the Fanuc© Control

Takumi USA has partnered with Renishaw to be the first CNC machine tool brand to offer Renishaw’s Set and Inspect app for the Fanuc© control. Set and Inspect will help job shops of all sizes be more efficient and profitable by making it possible for anyone with a part probe to immediately add inspection probing to their process.

Set and Inspect is so easy to use that virtually no training is required: the software’s intuitive interface guides the user through the process of creating a probing cycle, automatically generates the required machine code for the probing cycle, and sends it to the control. The company says that due to the intuitive graphical user interface (GUI) of the Set and Inspect app, even inexperienced operators can learn how to use it in 30 minutes or less.

While Set and Inspect is not loaded directly on the Fanuc control, Takumi engineers came up with a simple solution that provides a seamless integration of the app to the Fanuc control with the FOCAS 2 feature and added a tablet device to the control. With no need to learn macro programming, the machinist can easily program set-up probing routines or inspection routines and send them to the control memory with a single button press. The results are displayed on the same screen dur-

ing the cycle. They can be used to develop experience data for tooling, track changes to parts, and monitor adjustments to tool wear to determine when the cutter should be replaced.

With minimal training required, the operator jogs the probe into position using the handwheel, selects a probing cycle from the menu, and completes the user input fields. The Set and In-

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spect app does the rest – automatically generating the required machine code for the probing cycle and sending it to the control, which significantly reduces data entry errors and programming time.

Set and Inspect can automate a production cycle by inspecting features to determine tool wear and automatically adjusts the wear offsets.

Nikon Metrology Announces New Partnership

Nikon Metrology announces a new partnership with NSI Microscopy Inspection Automation of Wexford, Ireland. This agreement will help customers with Continuous Process Improvement by making use of auto-

mated microscopy.

NSI is a leader in the field of Continuous Process Improvement by using Automated Microscopy Software. The company specializes in medical device, pharmaceuticals, electronics, wafer technology, and other sectors involving challenging inspection requirements. The company's breakthrough platform, the NSI Toolbox, can detect any deviation and categorize it as a defect whether it be a dimension or an attribute surface defect, and then presents it to an operator in a result-driven interface. The NSI technology digitizes a production document, taking any process, converting it into a digital algorithm, and reducing the inspection to a simple one button press action.

The partnership allows Nikon Metrology to target the medical device

community in which NSI specializes, but this type of automation can be used in conjunction with any type of microscopy, or even images from the Nikon Metrology's NEXIV video-measuring system. The software is fully configurable, taking images from an optical device and analyzing them while presenting them on a result driven interface in micro-seconds. Even process specific and customized algorithms can be added to the standard NSI Platform to further improve that process.

OMIC R&D Begins Sponsored Research Project in Robotics for SMW-AU-TOBLOK

The Oregon Manufacturing Innova-



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tion Center Research and Development (OMIC R&D), a manufacturing research campus hosted by Oregon Tech, has received a \$154,000 sponsored project from SMW-AUTOBLOK Corporation, a worldwide manufacturer of workholding for turning and grinding machine tools. Jordan Meader, a robotics solution researcher at OMIC R&D, will be the principal investigator on the project.

OMIC R&D will conduct research in advanced and automated connection interfaces for robotic end effectors in collaboration with engineers from SMW-AUTOBLOK. The project, scheduled to take place over the next 12 months, will create a unique robotics connection interface that is expected to become available in

SMW-AUTOBLOK's catalog as an enhancement to small and medium shops integrating robotics. This ultimately aids in time loss associated with human interaction that often leads to damaged cables and connectors.

OMIC R&D members Doosan Machine Tools America and Ellison Technologies, leaders in the global CNC machine-tool industry, are contributing to the success of the project by consigning a state-of-the-art cobot from the recently debuted H2017 series. The cobot will allow OMIC R&D to demonstrate the capabilities of this research on a highly capable platform uniquely suited to the task of variable load machine tending.

New ISO Standard Offers Integrated Model for Manufacturing Quality Information

The Digital Metrology Standards Consortium (DMSC) recently had its ANSI/DMSC QIF 3.0 metrology standard harvested, approved and published by International Organization for Standardization (ISO) as the new ISO Standard 23952:2020. DMSC is the developer and maintainer of Quality Information Framework (QIF) and other metrology standards. These standards are intended to help advanced manufacturers reduce costs and offer a common format for product measurement results. They are also critical enablers for digital transformation via

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Model Based Enterprise (MBE).

ISO is an international standard-setting body comprised of representatives from various national standards organizations. Founded in 1947 and headquartered in Geneva, Switzerland, the organization promotes worldwide industrial and commercial standards with over 164 countries participating.

The new standard, known as ISO 23952:2020, is available directly from ISO, and officially titled “Automation systems and integration-Quality information framework (QIF)-An integrated model for manufacturing quality information.” This 498-page document describes the general content and structure of the entire QIF information model. It documents the highest level data structures of QIF using data dictionaries and XML schema files.

The standard seamlessly defines, organizes and associates quality information including: measurement plans, resources, part geometry with product and manufacturing information (PMI), rule templates for measurement, results and statistical analysis.

Jorgensen Conveyor and Filtration Solutions Celebrates 70 Years

Jorgensen Conveyor & Filtration Solutions, Inc. celebrated its 70th anniversary in 2020 with several enhancements – since their last milestone anniversary – aimed at further improving the company’s ability to support customers around the world.

Founded in 1950 by Charles T. Jorgensen, the company is currently led by Chuck D’Amico, the founder’s grandson, and it has grown to become a global leader in material handling innovation. In 2020, it has further solidified its management structure to support the company’s increasing size and scope. The new President &



CEO, Chuck D’Amico, was joined by a new director of sales and marketing, Karl Kleppek, and by Dustin Krueger who was promoted to the position of manager of engineering.

The new management structure was matched by new improvements to Jorgensen’s production capabilities. Part of the company’s commitment to utilizing the most cutting-edge technology for the highest possible part quality and cost efficiency, the million-dollar investment in the company’s Mequon, Wisconsin-based production facility included a 3 kW fiber laser cutting machine and a 250-ton press brake.

In recognition of the company’s expanded range of products, Jorgensen also expanded and refined its brand image. Now identified as Jorgensen Conveyor & Filtration Solutions, “the new branding honors the company’s past going back to their early patent of side chains resulting in the significant advancement of the hinged-steel-belt conveyor,” said Kleppek, “at the same time that it incorporates the new filtration equipment and chip solutions we’ve added to our product portfolio.”

BIG KAISER Announces Promotion of Jack Burley to President/Chief Operating Officer

BIG KAISER Precision Tooling announces the promotion of Jack Burley to president/chief operating officer as of January 1, 2021. Chris Kaiser, BIG KAISER president and

CEO of 30 years, will take on the role of executive advisor.

“Jack has been my right hand in this company from the very beginning,” said Kaiser. “He’s shown his leadership in managing the sales and engineering teams and has made many significant contributions to BIG KAISER including new product designs and development. He’s more than ready and deserving of this promotion.”

Burley began his career with BIG KAISER



more than 30 years ago and is currently vice president, sales and engineering. Burley is a U.S. Marine veteran and earned his degree in mechanical engineering from State University of New York at Alfred. As president/COO of the North American operations for BIG KAISER, Burley will continue to hold his seat on the board of directors for BIG KAISER.

“I am very honored and excited about my new position with BIG KAISER, and truly grateful to the executive management at BIG Daishowa and to Chris for placing their trust and confidence in me to lead the company,” said Burley.

CAMWorks Announces Partnership with CIMTechnology

HCL Technologies recently announced a CAMWorks partnership with CIMTechnology LLC, a provider of wire EDM software. As part of the agreement, CIMTechnology’s wire

Industry News

EDM programming software will be exclusive to CAMWorks. This will provide CAMWorks users access to more advanced wire EDM programming functionality for precise and intricate part cutting.

The partnership with CAMWorks and CIMTechnology will allow customers of both companies access to a culmination of technology and a wider range of CNC programming options.

CIMTechnology has specialized in wire EDM for more than 30 years.

Its wire EDM technology was previously sold through OEM partners as stand-alone systems or as technology added to current programming systems.

In the 1990s, CIMTechnology es-

tablished its business by writing and selling the Impact CAD/CAM System for wire EDM through Sodick, as well as developing Brother's PC-based conversational programming system for its drilling and tapping centers.

CAMWorks products include a range of milling and lathe solutions, in addition to wire EDM. Technologies such as feature-based programming, knowledge-based machining and TechDB allow users to automate their CAD/CAM functions. CAMWorks is also fully integrated with SOLIDWORKS, which means that users can work within the familiar user interface of SOLIDWORKS as they program the CNC code for their parts.

Tech Soft 3D Completes Acquisition of Visual Kinematics

Tech Soft 3D, a provider of engineering software development kits (SDKs), announces that it has acquired Visual Kinematics (VKI), maker of DevTools, a suite of component software development kits (SDKs) for computer aided engineering (CAE) applications.

"The CAE market is exploding and the applications for simulation will only continue to expand," said Ron Fritz, chief executive officer at Tech Soft 3D. "Analyzing how your design will function in the real world offers such massive cost savings that simulation is already well established



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in the design process. Tech Soft 3D is focused on adapting our tools to address this rapidly growing market space, as well as taking some of the core capabilities available in these technologies to serve the needs of additive manufacturing, AR/VR, IoT, machine learning, AI, etc.”

Based in Saratoga, California, the team at VKI has spent more than 30 years developing a component software product line that addresses a spectrum of CAE simulation technology needs: from mesh generation and interoperability tools to solvers, visualization and graphics. VKI’s tools provide developers with the ability to import/export of the analysis results from the vast majority of the world’s most widely used simulation solutions including those from ANSYS,

Siemens and Dassault Systèmes. VKI component tools have been installed in analysis products including mechanical, fluids, electro-magnetic and multiphysics applications.

DP Technology Announces Strategic Acquisition by Hexagon AB

DP Technology Corp. has signed an agreement to join Hexagon AB’s smart manufacturing portfolio in a strategic acquisition that will bring the best of smart manufacturing to a wider customer base.

Headquartered in Stockholm, Hexagon serves a multitude of ecosystems with its sensor, software, and autonomous solutions—from manufacturing and industrial facilities to mining,

agriculture, autonomous mobility, public safety, construction, and more. The ESPRIT CAM system will be included in Hexagon’s Manufacturing Intelligence division. “This is a natural fit, because manufacturing intelligence is exactly what ESPRIT is all about,” says Paul Ricard, co-founder and president of DP Technology “Ultimately, their acquisition of ESPRIT allows us to better serve our customers.”

Kays Engineering Celebrates 40th Anniversary

Kays Engineering Inc., the OEM of the DeHoff, Eldorado, and Techni-Drill brands of gundrilling machines, celebrated its 40th anniversary in December 2020.

Kays Engineering opened its doors

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for business on December 1, 1980 in Marshall, Missouri. Founded by Ed Kays, the company began as a small welding and repair shop, with Ed as the sole full-time employee along with three additional part-time employees. The company quickly progressed into a designer and builder of custom machinery for the automotive industry. The increase in business helped the company expand to more than 30 employees spread over four buildings.

Kays Engineering entered a new market in 1994 with the acquisition of DeHoff, a manufacturer of gundrilling machines located in Cranston, Rhode Island. The DeHoff manufacturing operation was moved to the Marshall facility in 1996. To accommodate the new product line, the company relocated to a new 50,000 square foot building that same year.

Another gundrilling machine manufacturer, Eldorado, was purchased in 2002 and relocated to Marshall from their original Milford, Connecticut location. This acquisition further diversified the Kays Engineering product lineup, and established the company as the largest supplier of gundrilling machines in the USA.

In June of this year the TechniDrill brand, a competing gundrill machine manufacturer in Kent, Ohio, was acquired by Kays Engineering

Schneeberger, Inc Welcomes New Regional Sales Manager

Schneeberger Linear Technology has added Ana Skeels as a new western regional sales manager to its sales team.

Having held sales management positions, Ana has over 15 years of direct sales experience and will be responsible for the following sales areas CA, NV, CO, AZ, WY, MT, OR, WA, ID, MT, WY, British Columbia & Mexico. Ana holds a Bachelor of Arts degree in International Business from

the University of Guadalajara, Mexico, and will be based in California.

"Adding Ana to our sales team will help Schneeberger continue to offer our

customers the solution-based support Schneeberger is known for," said Ross Blumenthal, national sales and marketing manager

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CGTech and Makino Partnership Provides Manufacturing Solutions

CGTech, the developer of VERICUT software, and Makino Milling Machine Co., Ltd., have renewed their strategic corporate partnership to better serve the mutual customer base of the two companies. Makino and CGTech have worked together for over 30 years.

“We are excited about this ongoing partnership,” said CGTech president Jon Prun. “Manufacturers who buy Makino machines have invested in world-leading machinery. Our aim is to offer a software solution designed to help purchasers of Makino machines get up and running quickly, while protecting their investment in the long

term.”

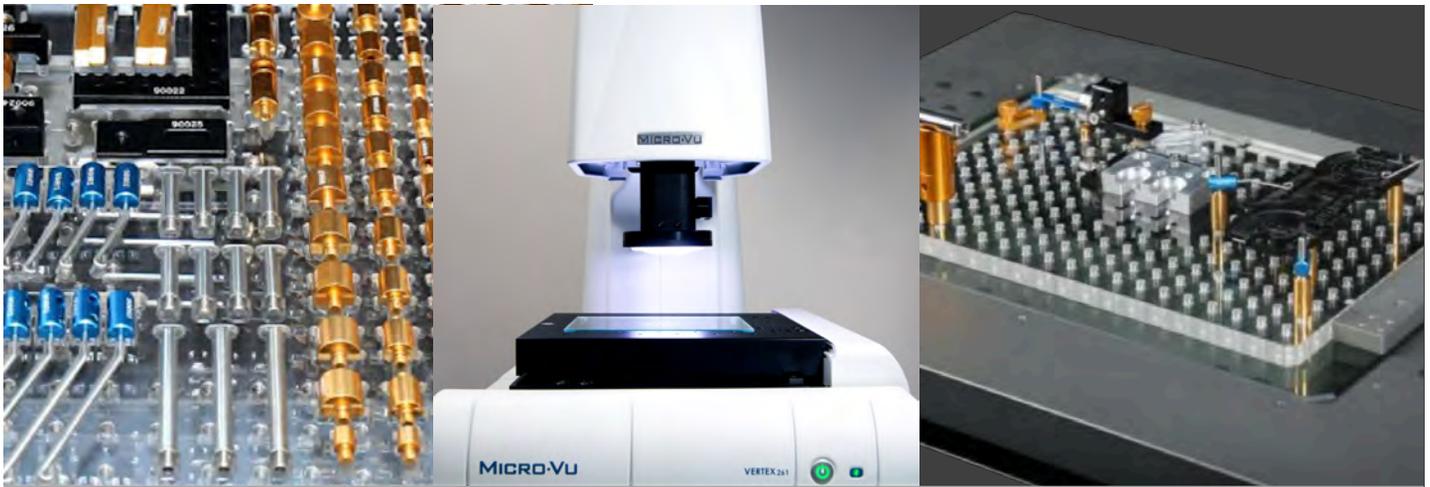
“Simulation software is very important for our business and machines,” said Makino Milling Machine president Shinichi Inoue. “Makino uses VERICUT in simulations and maintains an indispensable cooperative relationship with CGTech to help promote advancements to digital twins in the future. I thank CGTech for their great cooperation and look forward to deepening our cooperative relationship with them.”

“The partnership provides peace-of-mind to Makino machine tool owners, allowing them to protect their investment in the highest quality machines with VERICUT’s comprehensive simulation capabilities,” said the spokesperson. “Utilizing VERICUT digital

twins of Makino machines to verify the accuracy and quality of NC programs ensures that users’ NC programs will perform on even the most complicated machines, as intended, with the most accurate collision detection available. Inefficient motion or programming errors that could potentially ruin a part, damage the fixture or break the cutting tool can be corrected before the program is run on the machine tool itself.”

Cincinnati Incorporated Welcomes New President & CEO

Cincinnati Incorporated (CI) announces the appointment of Timothy L. Warning as president and chief



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executive officer effective November 30, 2020. Tim has also been elected to the board of directors at CI.

Tim has a strong track record and has consistently demonstrated the ability to build highly skilled and innovative teams to bring growth and profitability to the companies he has

served. Most of his career was spent growing businesses for Occidental Chemical Corporation (20 years) and various Dover Corporation companies (16 years). “It is both an honor and a privilege to lead a great Cincinnati company with such a rich history,” Tim said. “CI’s reputation for high quality and long-lasting durable machines is widely known throughout the industry, as is their commitment to the well-being of their employees.”

AVS Space and Fagor Automation collaborate in the Aerospace Market

For decades, Fagor Automation

has developed CNC Systems and high accuracy encoders that exceed the demands needed to manufacture precision components that will be used in space. Now, Fagor Automation and AVS Space are in the final testing stages of a two year collaboration to develop an encoder for space applications, capable of meeting the demanding requirements of current and future missions.

AVS develops space mechanisms and robotics that can be deployed in space; specifically for space exploration, instrumentation for earth observation, thermal control systems for communication, satellites, and electric propulsion thrusters.

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include an instrument for measuring the absolute position of the moving parts. The systems that require these devices are: altitude control systems, solar panel systems, antenna pointing systems, door opening systems, propeller pointing systems, instrument deployment, etc. In many of these cases, the measurement element is critical for the operation of the equipment, since parameters such as accuracy and resolution are linked to their operation. In addition, these devices must operate in the demanding environmental conditions of space, and must withstand radiation, high temperature fluctuations, and high vacuums.

Platinum Tooling Releases New Catalog

Platinum Tooling Technologies, Inc., the exclusive North American importer of standard and custom live tools, angle heads and multiple spindle tools manufactured by Hei-



mate GmbH, offers its latest catalog.

The catalog offers an updated look and features high quality machine tool accessory lines, including: Heimatec GmbH-Live tools and machining center angle heads, Tecnicrafts Industries-Collets and guide bushings for Swiss-type CNC lathes, Henninger GmbH & Co. KG-Mechanical, air and motor speeders, plus custom machining center angle heads and Andreas Maier GmbH & Co. KG (AMF)-Cleaning and marking tools.

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New Products



New 3-Axis Vertical Machining Center —Methods Machine Tools

Methods Machine Tools, Inc., recently released the MV 1600H, a three-axis vertical machining center (VMC). The MV 1600H combines

durable construction with an elegant design, featuring a rigid box-way Z-axis and versatile linear guideways on the X- and Y-axes.

"Plain and simple, it's the best of both worlds," said Nicholas St. Cyr, Methods Machining Centers product manager. "The hybrid box-and-linear design allows users to perform deep, exact cuts quickly," he said. "Customers don't have to sacrifice agility for precision." Rapid rates are 36 meters per minute (m/m) on the X- and Y-axes and 24 m/m on the Z-axis, ensuring fast tool movements.

Methods designed every aspect for cutting large workpieces. The work area spans 63.0" by 31.5" while the table has a capacity of 3,300

pounds (lbs.) and measures 66.9" by 33.5". Weighing approximately 41,800 pounds (lbs.), the MV 1600H has a heavy-cast construction, dampening reverberations and giving operators greater precision and improved surface finishing capability.

A host of features come standard on the MV 1600H, such as a 40-tool automatic tool changer (ATC) with big and heavy tool functionality. The comprehensive chip management system includes an external chip conveyor, chip flush in the bed, spindle flush, and an extra coolant gun, all designed to maximize machine uptime.

The industry-leading FANUC 0i-MF control comes with a 200 block look-ahead and MANUAL GUIDE

Boom Aerospace Relies on Verisurf Software



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Todd Wyatt
Metrologist, Boom Aerospace

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i software preinstalled, allowing operators to program operations at the machine for increased versatility.

The MV 1600H is a part of the Methods Machining Center product line. Developed by Methods utilizing decades of engineering and service experience and manufactured by Litz Hitech Corp., each machine is fully backed by Methods' industry-leading service and support. All Methods Machining Centers are engineered to precise standards, fully inspected to meet strict quality and design specifications, and comply with ISO/ASME standards. Additionally, the product line is the only brand of machining centers manufactured by a Taiwanese company with FANUC controls.

New Fiber Laser-Cutting Machine —Mazak Optonics

Mazak Optonics Corp. has launched the latest in its laser-cutting line up, the FT-150 FIBER. It was designed for high-speed cutting and reduced non-cutting process.

“The FT-150 FIBER tube laser machine includes a unique design and a proprietary agile U-axis to facilitate speed and productivity,” said a company spokesperson. “The U-axis offers impressive cutting speeds and enhanced part accuracy through a wide range of applications.”

The FT-150 FIBER utilizes a 2.5D cutting head with focus detection. The programmable angle of the B-axis enables bevel cutting of the material

thickness.

One specific option to improve productivity is extrusion-tapping. This value-added process utilizes a rotary spindle and eight tool positions.

A spatter guard protects the inner tube from cutting debris and reduces secondary processes. A part sorting system with dual belt conveyors offers optimal part processing.

The FT-150 FIBER's compact layout has an ergonomic design with the operator area, loading station and unloading station all located on the same side.

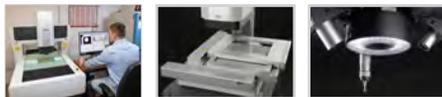
Mazak's CAD/CAM software, FX-TUBE, allows time study and consumption cost data to be easily integrated into a customer's ERP system, while the imported 3D data edit function reduces editing and waiting time. The MAZAK FX control includes important functions.



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New Products

Cutting System with Automated Pipe Cutting Option

—ESAB

ESAB Welding & Cutting Products offers its SmartPipe system for automated plasma or oxy-fuel cutting of pipe alongside a table for cutting flat plate. The SmartPipe standard line covers pipe in diameters from 2" to 12", lengths up to 20' and weights up to 2,200 lbs. SmartPipe HD (heavy duty) can handle pipe diameters up to 10' (including the common 36", 48" and 72" diameters) and lengths up to 60'.

The SmartPipe system consists of a pipe turning unit with a manually adjustable chuck and a CNC-controlled

turning axis, two or more adjustable-position pipe supports and a support track. A typical configuration would situate the turning unit between the cutting table and gantry rail (oriented parallel to the rail), but it can be located behind the table as well (e.g., parallel to the gantry).

SmartPipe also includes graphical programming software that creates programs for straight or bevel cuts for any pipe application, such as saddles, holes, slots or weld cut preparations. The software, which runs on ESAB's Vision controller, generates a 3D rendering of the finished pipe so users can confirm details before cutting.

For straight cuts, pair SmartPipe with any standard oxy-fuel torch or plasma system for cutting at up to

200 amps. For cutting bevels, pair SmartPipe with a bevel head such as ESAB's DMX Plasma Beveller or VBA (variable bevel angle) wrist.

New MAZATROL SmoothAi Control

—Mazak

"Mazak Corporation has unveiled its new user-friendly MAZATROL SmoothAi CNC," said a company spokesperson. "As the latest iteration of Mazak's line of MAZATROL controls, SmoothAi is the industry's first CNC to be designed specifically with 5-axis and multitasking operations in mind, leveraging AI support to make it



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New Products

possible for beginners and less-skilled users to handle operations that typically require much more machining experience and expertise.”

“With the power of AI, machine learning and advanced data management technology, the control also provides a wide variety of advanced programming



functions for complete ease of use and high-speed, high-performance precision machining,” said the spokesperson. The Solid MAZATROL function, for instance, lets shop use 3D CAD data and an AI-enhanced machining process selection for optimized MAZATROL part programs.

Other MAZATROL SmoothAi functions include SMOOTH Ai Spindle and Ai Thermal Shield. SMOOTH Ai Spindle leverages AI technology to optimize cutting conditions and surface finishes through automatic spindle vibration detection, while Ai Thermal Shield offers stable machining accuracy using machine-learning-enhanced heat displacement compensation.

The control’s advanced digital capabilities stretch from the office to the

manufacturing floor. Newly developed MAZATROL TWINS in conjunction with SMOOTH CAM Ai, SMOOTH Project Manager and SMOOTH Tool Management, for example, can be used to increase efficiencies in all types of manufacturing environments.

MAZATROL TWINS allows users to virtually duplicate the exact operation of machines on the factory floor from a front office PC. Data produced by virtual machines can then be outputted to machines on the floor equipped with the MAZATROL SmoothAi CNC. With SMOOTH CAM Ai, users can use AI technology to create programs and edit, simulate or analyze them prior to sending them out to multiple machines also equipped with SMOOTH CAM Ai.

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New Products

SMOOTH Project Manager provides convenient management of files and data for such items as tooling, fixtures, machining parameters and 3D part models required to execute machining programs. The SMOOTH Tool Management software manages data for the large amounts of tools often used in big production facilities. The function allows users to centrally manage tools, register tool data and perform tool set-up to reduce machine non-cut time.

New High-Speed Video Measuring System For Quality Control

—Nikon

Nikon Corporation in Japan has developed a new CNC video measuring system that provides what they report is unparalleled accuracy, repeatability, and reliability. Also known as a vision measuring system, the NEXIV VMZ-S3020 is optimized for automated quality control applications in a production line, as its high speed allows real-time feedback of measured results to the manufacturing process.

The system is ideal for inspecting a wide variety of mechanical, electrical,

electronic, moulded, cast and pressed components that fall within its 300 x 200 x 200 mm working volume. Nikon's proprietary optical measuring, image processing and analysis technologies are employed to detect feature edges at very high speed, capturing accurately and automatically the shape and dimensions of even the most complex components.

Numerous enhancements to the robustness of the unit and its functionality have been made compared with the instrument that it replaces, model VMZ-R3020. The new NEXIV VMZ-S series can achieve even faster movements and image capture steps than its predecessor by the improve-



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New Products

ment of stage control technology and image processing algorithm. In-house-developed, high-resolution, linear encoders feed the position of the stage back to the control, maintaining high measuring precision and consistency. Image transfer and subsequent processing of the data are also quicker.



Nikon has designed top-quality

optical systems using its own exceptional “glassware” to deliver high quality images and further realize accurate measurement data within the field of view and beyond. Enhancements to the through-the-lens (TTL) laser auto focus, giving repeatability to better than half a micron.

Fast laser scanning (1,000 points/sec) can rapidly acquire the cross-sectional shape of a surface and evaluate the relative heights, meeting the measurement needs across a wide variety of samples.

A fully featured measurement software environment, NEXIV Auto-Measure, enables high accuracy, high speed, and high usability with easy measurement cycles using tools that are accessible in a user-friendly GUI.

For simple shape components, it has been enhanced with support functions which automate part of the measurement programming process.

Hexagon RS6 Measures Challenging Surfaces —Exact Metrology

Exact Metrology’s Hexagon RS6 laser scanner provides accurate, high-speed scanning. The company reports the RS6 scans as many as 1.2 million points per sec. with a scan rate of 300 Hz and includes a laser stripe of 150 mm at mid-range with a visual guide that provides real-time feedback for stand-off distance.

The company says the laser scanner’s Systematic High-Intelligence



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Noise Elimination (SHINE) technology allows it to scan challenging surfaces like glossy black plastic automotive body parts and molded carbon-fiber components without quality or productivity reductions. It says this technology also allows users to scan 99% of parts without touching the scanner exposure.

Users can remove the scanner when necessary and replace it without additional calibration thanks to the RS6's repeatable mounting and Absolute Arm 7-Axis compatibility. According to the company, measuring is easier with the arm-mounted scanner due to reduced preparation, reduced set up, fewer settings and its standard full-frame, full-line wide scans.

Tubeless Air Chuck Released —Northfield Precision

Northfield Precision Instrument Corporation has developed a brand-new chucking system that requires no air tubes or hoses. Users charge these Pressure-Lok air chucks using a special handle. Users can then mount them to rotary tables with no through-hole, tombstones, pallets or transfer systems. Northfield recommends the Pressure-Lok air chuck for any machining operation that does not have an air tube near the machine. These air chucks hold air pressure for over two weeks.

Northfield Precision Instrument chucks are available in SAE or metric,

with sizes from 3" to 18", guaranteeing accuracies between 0.001" and 0.00001".

Optimized 5-axis Post Processor for FANUC CNCs —CNC Software

FANUC America and CNC Software, global leading CAM systems provider of Mastercam, introduce a new post processor designed to optimize 5-axis capabilities in FANUC CNCs. The new post processor allows advanced machine tool operators to reduce their cycle times while boosting part accuracy, particularly for CAD/

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New Products

CAM generated 5-axis simultaneous contouring part processes.

A growing number of manufacturing industries, such as aerospace, medical and mold & die job shops, are incorporating 5-axis simultaneous processing in their operations. By optimizing FANUC CNCs with this new Mastercam post processor, machine tools will be able to produce parts—modeled in the CAD system—more



precisely.

“For 5-axis simultaneous contouring, a quality CAD/CAM system is critical,” says Rick Schultz, Aerospace program manager for FANUC America. “FANUC has worked closely with CNC Software to make it easy for programmers to create optimal tool paths using the advanced algorithms available in the 5-axis Milling Standard Package for FANUC’s 30i-B and 30i-B Plus Series controls.”

Key functions in the Milling Standard Package for FANUC controls include Tool Center Point (TCP), Workpiece Setting, Error Compensation (WSEC), Easy Setting Function to support multiple acceleration and process profiles, and advanced lookahead algorithms AICC II with Smooth

Tolerance Control+. This package used with the latest FANUC-controlled machine tools and the new Mastercam post processor is designed to power the future of advanced 5-axis machining.

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New Products

Versatile 5-Axis DVF Series

—Doosan

Doosan Machine Tools' DVF Series of compact 5-axis machining centers is built for a wide range of 5-sided and simultaneous 5-axis applications. DVF machines are fully loaded to meet customer needs for cutting diverse and complex shapes in one setup. The Fanuc 31i-B5 CNC controller makes full 5-axis simultaneous control (all axes feeding at once) possible.

The DVF 5000 is equipped with a CAT40/BIG PLUS® taper 18,000 r/min spindle, which facilitates high

speed metal removal. The DVF 5000 features a 19.7" diameter B- over C-axis rotary table with a 24.8" option. The machine table is an integrated cantilever style full 5-axis table, which allows for the machining of parts from a variety of angles. Built-in table support holds a maximum weight of over 880lbs and minimizes any table deflection. The rotary table is designed for user friendliness and consummate work efficiency. Absolute glass scales on XYZ axes and angular optical encoders on B and C axes ensure high resolution positioning and repeatability.

The DVF 6500 has the same spindle as the DVF 5000, but is designed with an integrated 25.6" diameter A- over C-axis rotary table. Even larger is the new DVF 8000 version, which comes with a 31.5" diameter rotary table.

Each DVF machine comes with a 60-tool servo-driven automatic tool changer that can be expanded up to 120 tools.

These machines can be customized with a diverse range of tailored options. One example is an optional/retrofitable AWC (Auto Workpiece Changer) for the DVF 5000, which gives you lights out machining ca-

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pability. The AWC can be ordered in numerous pallet configurations: 4, 6, 8, 10, 12 and 24. The DVF 6500 and DVF 8000 models also come with their own automation options.



New Generation GL Series Turning Center —Romi

Romi has introduced the New Generation GL Series 2-Axis horizontal turning centers. The new machines are available in four models with maximum cutting diameters ranging from 11" to 19.3" and Z travel ranging from 23.6" to 47.2". Designed for medium

to high production environments, the GL Series features notably high power, torque and feed force.

Models include the GL250, GL300, GL350, and GL450. Each is constructed with durable roller ways on all axis to produce high rigidity. A built-in spindle motor with a chiller incorporated and direct drive servomotors results in high response speed, accuracy, less vibration, and lower

maintenance requirements.

The all new GL Series come standard with active thermal compensation to maintain consistent accuracy. The tailstock is programmable and servo-driven. Position, speed, and force are determined directly via the Fanuc controller

Each model comes with a 12-station turret with a choice of fixed tools with a Romi disk, driven tools with a VDI or BMT disk, driven tools with Y-axis, or dual spindle with driven tools and Y-axis.

The CNC control features a Fanuc Oi-TF with 15" LCD touchscreen and Fanuc 32iB with 19" LCD touchscreen for dual spindle version machines and

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New Products

is the newest generation of Fanuc's Series iHMI. It is designed to produce faster, more accurate performance for turning applications with separate areas on the main screen for planning, machining, improvements, and utilities. Functions are accessible with just two clicks. It comes standard with an ethernet interface, as well as a compact flash card and USB ports

Expanded High-Pressure Coolant Turning Tool System

—Tungaloy

Tungaloy has expanded its TungTurn-Jet solution, a high-pressure

coolant turning tool system, to include coolant-through toolholders and PSC/VDI (DIN69880) adapters. The company reports this combination eliminates the need for hoses, fittings and spare parts that are commonly needed for coolant-through tooling.

"The TungTurn-Jet system strategically directs the internal coolant jet to an optimal position, close to the cutting point on the insert rake face," said a company spokesperson. "This provides effective chip control, especially during the machining of exotic materials, which is not the case with conventional external coolant supply methods. The holder also feeds the other coolant jet from the bottom to

minimize flank wear."

The TungTurn-Jet holder uses internal channels in the toolholder to deliver coolant supplied directly from the machine turret through the holder out to the nozzle, streamlining tool handling and set-up for reduced machine downtime. "Since there is no need for conventional external hoses to be set up, chip bird-nesting on the hoses are a thing of the past," said the spokesperson. The latest additions to the TungTurn-Jet system include Tung-Modular system holders for grooving, parting and thread turning, as well as ISO external turning holders.

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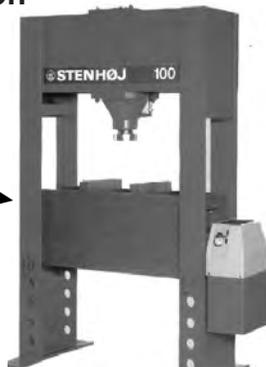
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New Products

Insert Expansion with Grade for Steel and Stainless Steel

—Kyocera Precision Tools

Kyocera Precision Tools has expanded its insert lineup of the GBA grooving system with insert grade PR1625 for steel and stainless steel grooving applications.

“PR1625 is designed with high hardness and toughness with a highly stable carbide base material and MEGACOAT NANO coating technology for excellent wear resistance when grooving light interrupted to heavily interrupted cuts,” said a company spokesperson.

The GBA grooving system features inserts with three usable cutting edges

that are available in grades PR1215 for general purpose grooving,

TN620 for surface finish oriented grooving, and stable PR1625 for more interrupted cuts. The insert’s GM chipbreakers are designed to maintain smooth chip control that provides a more stable groove in a wide range of shallow grooving applications.

New TURNPWR Control —ACU-RITE

Offering lathe machinists a new easy-to-use turning control with state-of-the-art features as standard, HEIDENHAIN presents the highly anticipated ACU-RITE brand TURNPWR control. The new TURNPWR



control is a workshop-oriented turning control that enables the user to program conventional machining operations right at the machine in an easy-to-use conversational programming language. It is designed for turning machine tools with up to two axes.

TURNPWR was developed to satisfy the wants and needs of lathe machinists where manual and automated

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operation are both useful and needed. TURNPWR promises to enable the user to maximize throughput by significantly reducing set-up time, scrap and other non-productive operations.

The well-known ACU-RITE conversational programming format for controls is a user-friendly method of writing part programs and included in the TURNPWR, however G-code (ISO) programming can also be used. Basic editing of G-code programs is also possible.

On the new TURNPWR, a 12.1" high-resolution display boasts a screen layout that is clearly arranged and user friendly. Preview graphics in the editor illustrate the individual machining steps for programming the contour as

well as corresponding tool path generated using only dimensions pulled from a production drawing. It also accepts DXF files.

TURNPWR is a closed-loop system with positioning feedback provided by rotary encoders inside the motor assemblies. When fitted with the (optional) ACU-RITE precision glass scales (1 $\mu\text{m}/0.00005''$ resolution), TURNPWR also includes Position-Trac™, an advanced unique feature that enables the user to easily, quickly and accurately re-establish work piece zero after shutting down or power loss.

Nirox High-Performance Drill from Sphinx for Low RPM Released —BIG KAISER

BIG KAISER Precision Tooling introduces the Nirox high-performance drill from Sphinx, the newest addition to its cutting tool lineup. Available in diameters from 0.30-3.00mm, the Nirox was developed for use at low cutting speeds in unstable environments. The Nirox geometry has a degressive helix angle equal to



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The Mytrunnion-5G offers an extra-large work envelope of 24.8" x 19.7" high and a table load capacity of 880lbs with a sliding ceiling cover.

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New Ultra High Precision 5-Axis —Kitamura

Kitamura Machinery has introduced the Mytrunnion-5G 5-axis vertical machining center.

The Mytrunnion-5G has been mechanically and electronically designed

specifically for speed, rigidity and flexibility in complex 5-axis machining. Induction hardened solid box way construction offers the vibration damping properties necessary for the finest surface finishes. The A-axis fully integrated trunnion table (-120 to +30°) is driven by an ultra-high precision worm wheel & shaft. A standard

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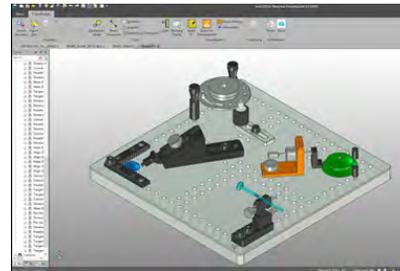
built-in, rigid, trunnion style tilting table, ballscrew cooling, Heidenhein linear and rotary scale feedback in X, Y, Z, 4th & 5th axes and Kitamura's IAC System 1 thermal compensation system.

The Mytrunnion-5G has a standard 50-tool high speed ATC with an optional 100T upgrade available as a field installed option. A standard double decker style chip conveyor and filtration system, 220psi coolant through the spindle and base wash and overhead wash shower coolant offer chip evacuation filtration to 100 microns.

Kitamura's Arumatik-Mi Con-

trol offers 1680 block look ahead and super-fast, super smooth processing speeds of 2,800 blocks/sec. for faster machining of more complex workpieces. A completely customizable, icon driven touch screen offers a user friendly expandable control environment for the operator.

Unique standard features such as remote monitoring screens, on demand "HELP" guidance, visual work setting, tool breakage detection, free software upgrades throughout the life of the control, and collision safety functions all work in tandem .



FixtureBuilder 8.0 Reduces Set-Up Times —Renishaw

Renishaw has released FixtureBuilder 8.0, the latest version of its 3D fixture modeling software. The

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software enables users to design metrology fixturing set-ups without having to use coordinate measuring machines (CMMs) and other inspection devices, reducing set-up time and increasing productivity. Users can import CAD models of parts, then export the entire fixturing set-up, along with the new part, into inspection programming software.

In FixtureBuilder 8.0, users can model fixtures that use the Renishaw QuickLoad rail system, which is used on CMMs and designed to provide a secure workholding position when used in conjunction with QuickLoad base plates. These are attached to the rail on either side using quick-release magnets and location pins. The interchangeable design of the rail and plates maximizes the machine operator's ability to inspect and release parts swiftly.

The software also now supports metrology tables, M12 fixtures, 1/4-20 fixtures and many other new fixturing components, providing users with access to a wide range of fixturing components in the software's library.

An improved mechanism mode provides real-life movement and collision detection with increased precision, resulting in faster fixture set-ups. Exporting the fixture model into inspection software has become faster and easier in the new version as well, making the inspection programming process more streamlined.

In addition to supporting Parasolid, STEP, ACIS, STL, IGES and many other file formats, FixtureBuilder 8.0 allows users to import and export the latest versions of these 3D CAD file formats.

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...Hotline Continued From Page 8

Boeing-Built Space Force Satellite Passes Design Review

Boeing and the U.S. Space Force successfully completed the first major engineering design review for the Wideband Global SATCOM (WGS)-11+ communications satellite. This successful review demonstrates that Boeing is ready to proceed to the final system design phase. Production will begin next year at Boeing's El Segundo factory, with delivery scheduled for 2024.

WGS-11+ features a modern digital payload that performs at twice the operational capability of its predecessors, increasing the availability of military-grade communications. Leveraging advances in Boeing commercial technologies, it will provide secure communications to connect U.S. and allied forces globally.

The current WGS constellation, consisting of 10 satellites, is the backbone of the U.S. military's global communications system, providing flexible, high data-rate connectivity. Users include all U.S. military services, the White House Communications Agency, the U.S. State Department and international partners.

General Atomics and Framatome Collaborate to Develop a Fast Modular Reactor

San Diego based General Atomics Electromagnetic Systems (GA-EMS) announced that it is collaborating with Framatome Inc. to develop a new helium-cooled 50-Megawatt electric (MWe) Fast Modular Reactor (FMR) concept that will produce safe, carbon-free electricity and can be factory built and assembled on-site, which will reduce costs and enable incremental capacity additions. The GA-EMS led team will be able to demonstrate the FMR design as early as 2030 and anticipates it being ready for commercial use by the mid-2030s.

The FMR will be designed for enhanced safety and ease of operation with fast-response load following and overall high efficiency. The passively safe gas-cooled FMR will use a non-hazardous helium coolant—a chemically inert gas that is nonexplosive, non-corrosive, and does not become activated. Because the reactor is dry-cooled and uses virtually no water to operate, it can be sited nearly anywhere. The power conversion forgoes the use of complex steam generators and pressurizers, and the fuel will operate for approximately 9 years before requiring replacement. The direct helium Brayton cycle enables fast grid response, with up to a 20% per minute

Boom Supersonic Aircraft with 3D Printed Flight Hardware Components

VELO3D of Campbell, CA. has announced that Boom Supersonic's XB-1 aircraft includes 21 flight hardware components that were manufactured by VELO3D's Sapphire 3D metal printer. "Unveiled at Boom's hangar in Centennial, CO,

XB-1 marks a turning point in commercial viability for supersonic travel and demonstrates the power of additive manufacturing (AM), or 3D printing, to enable innovation while accelerating product development," said a spokesperson.

"Aviation hardware is especially difficult to manufacture with 3D metal printing due to challenging aerodynamic designs that must be balanced with superior durability and high temperature requirements," said Benny Buller, CEO and Founder of VELO3D. "VELO3D's technology allows the production of lightweight, complex designs for mission-critical applications in the toughest operating conditions. Our partnership with Boom is truly an advancement for the metal AM industry, and XB-1 supersonic aircraft is a game-changer for the aviation industry."

Boom Supersonic and VELO3D announced a partnership in 2019 to manufacture complex flight hardware to build XB-1, and ran a series of qualification trials on VELO3D's Sapphire system. The printed titanium parts are used for engine hardware, the environmental control system and structural components.

Chatsworth Aerospace Firm Acquires Rights to Pratt & Whitney Engine Parts

Chatsworth aerospace manufacturer Ontic has acquired manufacturing rights from Pratt & Whitney Canada Corp. for more of its JT15D engine parts, the company announced in November.

This is the fourth phase of an acquisition process that began in 2015, the companies said, adding to Ontic's portfolio of engine support capabilities. The private company will manufacture and sell JT15D components through its Chatsworth facility and continue distribution through Boeing, Ontic said in a press release.



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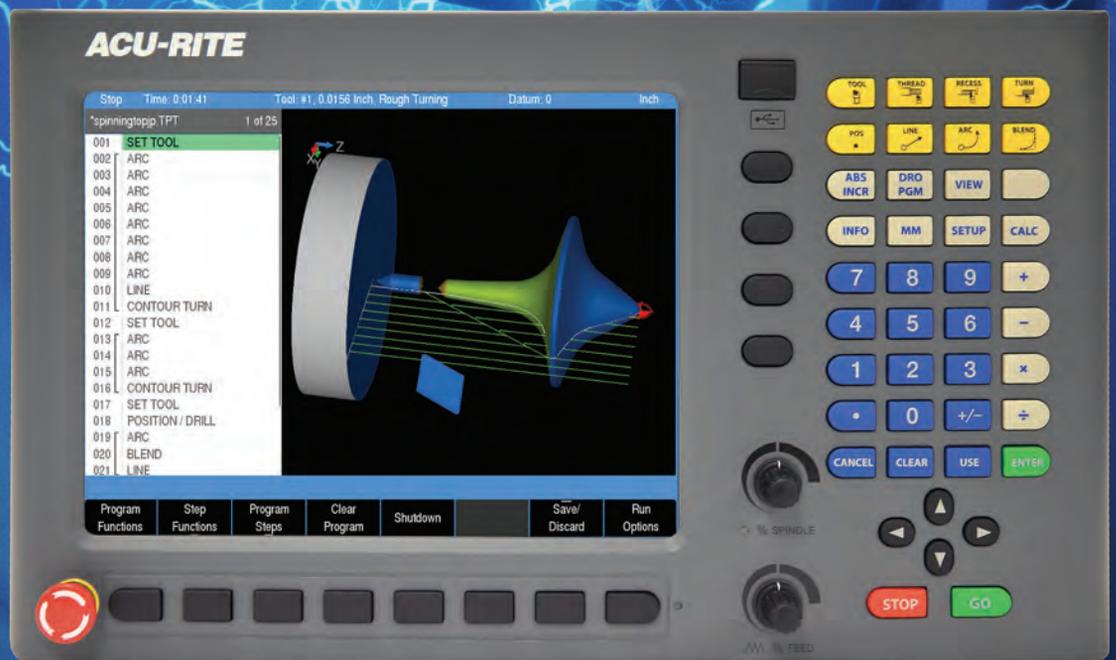
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