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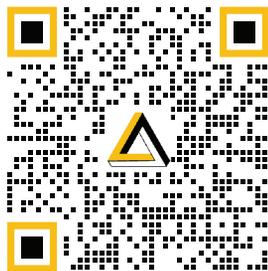
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February/March 2022 • Volume 40 No 3

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Austin Roche of AR Machine Group has loved making stuff since he was a kid.Page 22



S & R's manufacturing center in Valencia, Ca. is 8000sq.ft. and filled with 14 CNC machining centers from Haas and Doosan.....Page 30



Brothers Erik (left) and Ed (right) Sicairos went into business together in 2000. It's been a journey, but the path they walk now is the one they always imagined.....Page 38

Coming in April/May 2022 Software and Controls—Don't miss this issue! It will be an idea-packed focus on developments in computer controls, networking, automating plant management, the latest in CNC software, hardware and machine control technology.

*Editorial: March 25, 2022
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February/March 2022

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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2022 Just Flew In

How can it be 2022 already? They say time goes faster as you get older so I must be really old as 2021 was a blur.

This issue is our annual Aerospace and Defense issue and I hate to admit that the dreaded C word slowed down the aerospace industry a little. People were not flying like they used to but I think that it is slowly getting better. The need for new, more efficient planes is coming back. We try to pack as much information and feature articles as possible in each issue of CNC WEST. To be honest the more advertisers we have, the larger the magazine can be. It is expensive to print and pay the postage on 17,500 copies. Like everything else paper cost have risen drastically the last year which has not made it easy for anyone in the publishing industry.

Thank goodness that our advertisers see the value in having their message seen by so many possible western region customers. And a big thanks to all of those who still read print. Of course, if for some reason you can't read a physical copy there is always a copy online at www.cnc-west.com.

This issue has feature articles on a couple of southern California shops and a northern California shop. The cover story is on the northern California shop and their typical customer is in aerospace and robotics, but more and more jobs are coming from a local government lab and companies who make drones, and satellites. They have upgraded equipment which helps land more and more jobs.

Another article is on a Valencia, CA. shop that over the years made their own vises to do aerospace and other work. Instead of competing for aerospace accounts they decided to put their aerospace manufacturing experience into designing, building, marketing and selling a unique work holding solution that they say is increasing their productivity.

Our third article from Sean Buur features two brothers who have been on quite a rollercoaster ride in the industry, but they would not have it any other way. With lots of help from Harvinder Singh of Expand Machinery the rollercoaster is a pretty smooth ride at the moment.

Tim Paul follows up on his last article about training with one about recruitment and knowledge sharing. His last article received all kinds of buzz, and my guess is that this one will too. CNC WEST is lucky to have Tim offer his services.

There is much more and thanks so much for reading CNC WEST.

Sincerely,

Shawn Arnold

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 Publisher

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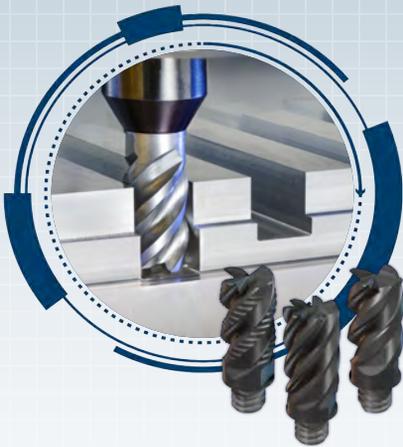
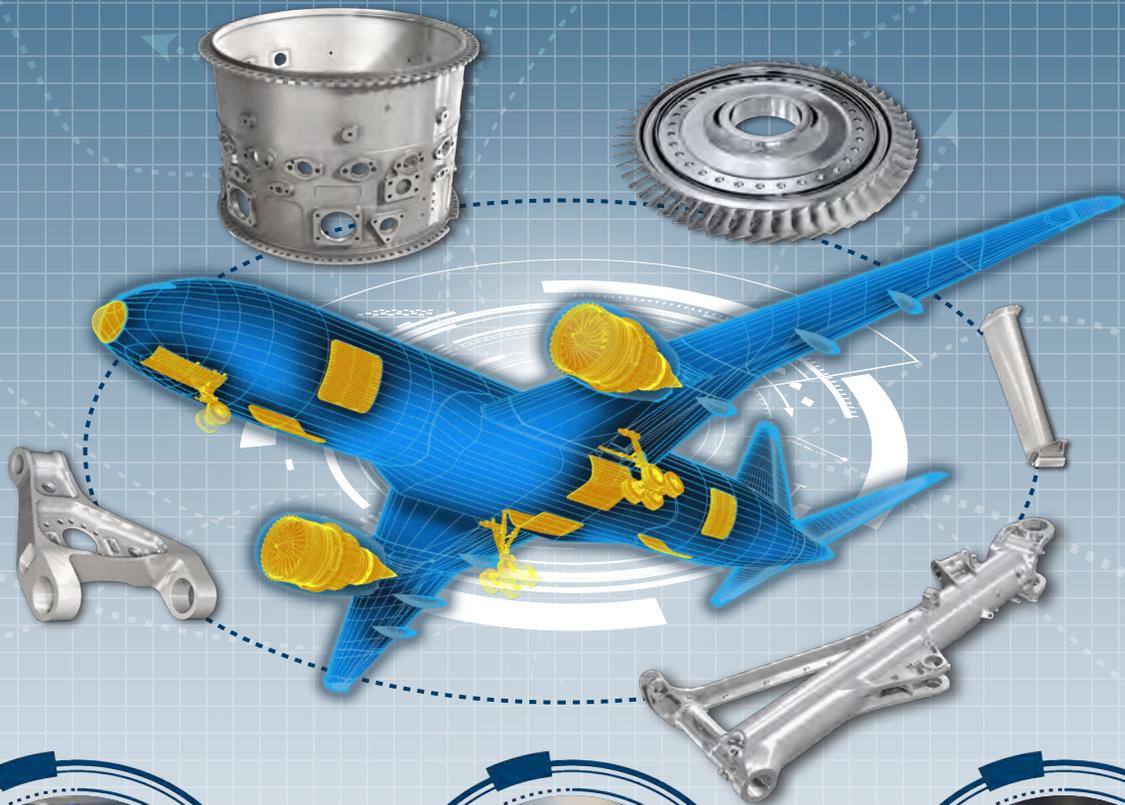
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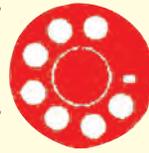
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Austal to Spend \$100M on National City, CA. Site

Austal USA, which builds small surface ships for the U.S. Navy, has big growth plans for National City.

The defense contractor expects to make approximately \$100 million worth of improvements to a newly leased bayfront site south of the 32nd Street naval station. In addition, it plans to expand its local headcount of 60 employees to more than 300 by the summer of 2023, according to Larry Ryder, Austal USA's vice president of business development and external affairs.

The business announced plans to bring in a 531-foot dry dock, suitable for substantial repair jobs. Austal plans to maintain and repair small Navy surface combatants – including the Austal-built Littoral Combat Ship and the Navy's new class of frigates – as well as ships from the Military Sealift Command and U.S. Coast Guard.

Austal is investing approximately \$100 million on the dry dock, lease acquisition and other capital expenditures, Ryder said.

Kratos Defense Building Affordable Jet Engines

Kratos Defense & Security Solutions Inc. announced that it received an initial production order for a new, affordable, high performance jet engine for an aerial vehicle application. Its customer, which it did not name, is in the national security space. Financial terms were not disclosed.

Kratos said it is under contract from several government and other national security related customers for the development of next generation, affordable, high performance turbojet, turbofan and other engine types for unmanned aerial system (UAS) aircraft, cruise missiles, powered munitions, and other related systems. Work under the just announced order will be performed at a secure Kratos manufacturing facility.

Separately, Kratos announced that it received initial funding of approximately \$4 million on a new, single-award C5ISR program (the initials stand for Command, Control, Communication, Computing, Combat System, Intelligence, Surveillance and Reconnaissance). The customer was not identified.

Rocket Lab to Acquire Space Solar Power Products Company SolAero for \$80M

Long Beach-based rocket launch company Rocket Lab USA Inc. announced Dec. 13 that it has agreed to acquire Albuquerque, N.M.-based space solar products company SolAero Holdings Inc. for \$80 million in cash. The acquisition is expected to close in the first quarter of 2022.

SolAero Holdings is one of only two companies that produce high-efficiency, space-grade solar cells in the United States; the other is Spectrolab, a subsidiary of Chicago-based Boeing Co.

Space solar cells, also known as space solar panels, are used to power satellites, some spacecraft and other space-based facilities such as the International Space Station and the Hubble Space Telescope.

By merging with Rocket Lab, SolAero hopes to use Rocket Lab's resources and manufacturing capability to boost the production and efficiency of its space solar cells.

Under the deal, SolAero Chief Executive Brad Clevenger will stay on to lead the SolAero team at its production facility in Albuquerque.

Boeing and Atlas Air Worldwide Announced an Order for Four 777 Freighters.

The order, placed in December, rounds out a record-setting 2021 for Boeing's freighter family including new-production and converted models. Boeing has forecast that the global freighter fleet will grow by 70% in the next 20 years, with freight carriers such as Atlas Air supporting a rapidly expanding global e-commerce business and evolving supply chains.

Through November, Boeing had surpassed the previous freighter record including 80 orders for new production freighters and more than 80 orders for converted models.

Continued on page 74...



Discover the New 'Star' in the STAR CNC Galaxy

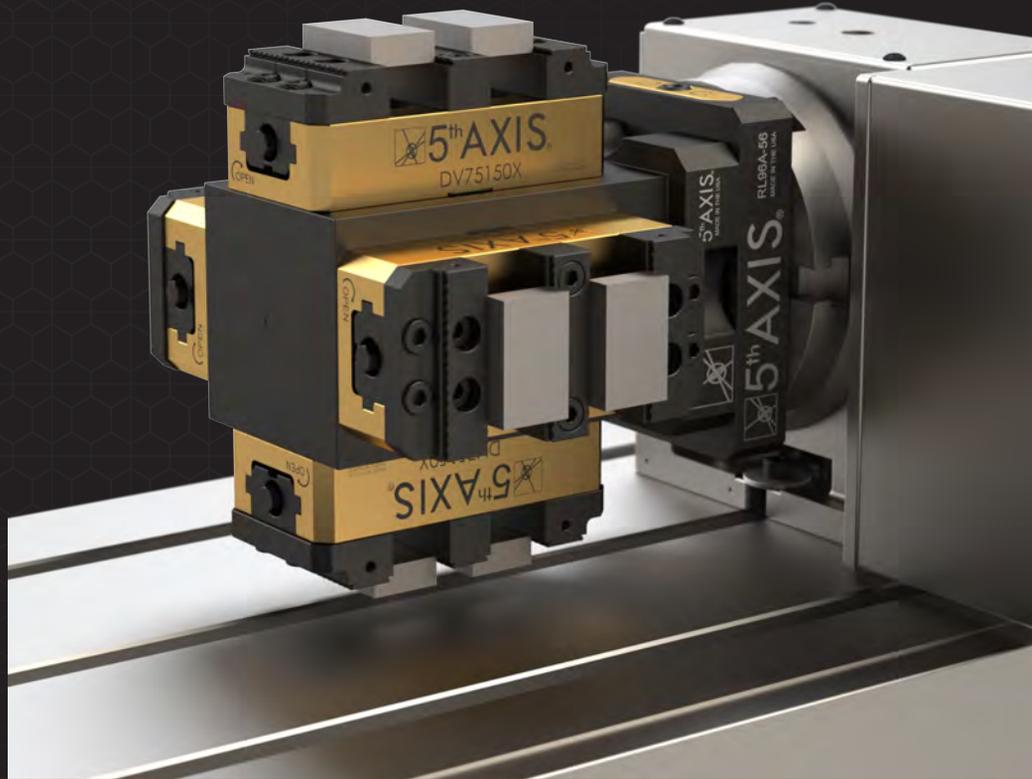


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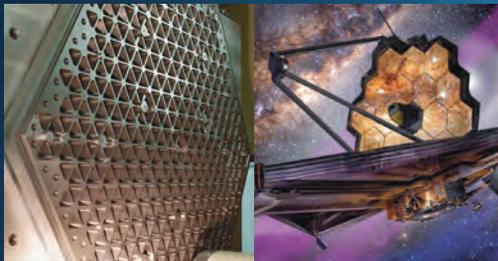
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1.5mm x 60° Serrations							
6"	0.472	10mm	0.787	6"	2.00"	RKT-6200A	\$ 87.07
	0.472	10mm	0.787	6"	4.00"	RKT-6400A	\$ 142.54
8"	0.551	12mm	0.984	8"	2.00"	RKT-8200A	\$ 102.36
	0.551	12mm	0.984	8"	4.00"	RKT-8400A	\$ 196.91
10"	0.630	12mm	1.181	10"	2.00"	RKT-10200A	\$ 151.40
	0.630	12mm	1.181	10"	3.00"	RKT-10300A	\$ 195.31
12"	0.709	14mm	1.181	12"	3.00"	RKT-12250A	\$ 234.40
	0.709	14mm	1.181	12"	4.00"	RKT-12400A	\$ 381.55
	0.827	16mm	1.181	12"	3.00"	RKT-12208A	\$ 213.35
15"	0.827	16mm	1.181	15"	4.00"	RKT-12408A	\$ 381.55
	0.866	20mm	1.690	15"	2.50"	RKT-15250A	\$ 570.70
18-21"	0.984	20mm	2.362	21"	4.00"	RK3-21400A	\$ 1,275.46
	0.984	20mm	2.362	24"	4.00"	RK3-24400A	\$ 1,775.07

Chuck Size	Groove Width	Screw Size	Hole Space	Height	Length	ALUMINUM Part #	Price SET OF 3	STEEL Part #	Price SET OF 3
1.5mm x 60° Serrations									
6"	0.472	M10	0.787	1.50	3.00	KT-6150AF	\$ 32.11	KT-6150F	\$ 27.52
	0.472	M10	0.787	3.00	3.00	KT-6300AF	\$ 49.74	KT-6300F	\$ 53.94
8"	0.551	M12	0.984	2.00	3.75	KT-8200AF	\$ 46.64	KT-8200F	\$ 48.80
	0.551	M12	0.984	2.00	4.00	KT-8201AF	\$ 56.40	KT-8201F	\$ 56.19
10"	0.630	M12	1.181	2.00	4.50	KT-10200AF	\$ 54.35	KT-10200F	\$ 54.96
	0.630	M12	1.181	3.50	5.00	KT-10300AF	\$ 71.14	KT-10300F	\$ 79.49
12"	0.709	M14	1.181	2.00	5.50	KT-12200AF	\$ 89.57	KT-12200F	\$ 86.33
	0.709	M14	1.181	3.00	5.50	KT-12300AF	\$ 115.05	KT-12300F	\$ 129.45
	0.827	M16	1.181	2.00	5.50	KT-12208AF	\$ 89.57	KT-12208F	\$ 86.33
15"	0.827	M16	1.181	4.00	5.50	KT-12408AF	\$ 128.86	KT-12408F	\$ 156.37
	0.866	M20	1.690	2.50	6.50	KT-15300AF	\$ 155.87	KT-15300F	\$ 182.68
18-21"	0.984	M20	2.362	2.50	6.50	KT-15301AF	\$ 166.68	KT-15301F	\$ 182.68
	0.984	M20	2.362	2.50	7.00	K3-21250AF	\$ 166.14	K3-21250F	\$ 207.54
18-21"	0.984	M20	2.362	6.00	7.00	K3-21600AF	\$ 412.81	K3-21600F	\$ 540.17

*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 Size	Groove Width	Tongue Width	Screw Size	Hole Space	Hgt Inch	STEEL SOFT JAWS		ALUMINUM ROUND JAWS		
						Part Number	Set Price	Part Number	Set Price	
6"	.312	.499	3/8	1.500	2.00	TG-6200F	\$ 50.39	6"	RTG-6200A	\$ 91.92
					4.00	TG-6400F	\$ 86.71	8"	8-RTG-6400A	\$ 190.43
8"	.312	.499	3/8	1.750	2.00	TG-8200F	\$ 26.81	8"	RTG-8200A	\$ 124.47
					3.00	TG-8300F	\$ 77.97	10"	10-RTG-8300A	\$ 288.16
10"	.501	.749	1/2	2.125	2.00	TG-10200F	\$ 40.93	12"	12-RTG-10200A	\$ 221.74
					4.00	TG-10400F	\$ 91.15	15"	15-RTG-10400A	\$ 727.86
12"	.501	.749	1/2	2.500	2.50	TG-12250F	\$ 87.38	15"	15-RTG-12250A	\$ 592.44
					4.00	TG-12400F	\$ 123.85	18"	18-RTG-12400A	\$ 975.01
15"	.501	.749	5/8	3.000	2.50	TG-15250F	\$ 105.55	21"	21-RTG-15250A	\$ 1,039.59
					4.00	TG-15400F	\$ 137.62	24"	24-RTG-15400A	\$ 1,775.07

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Chuck Dia	Chuck Reference	Part Number	Set Price
6"	140/165/175/170	GBK-160-A	\$ 310.00
8"	200/210/215/225	GBK-200-A	\$ 340.00
10"	250/265/275	GBK-250-A	\$ 380.00
12"	315/340	GBK-315-A	\$ 470.00
15"	400	GBK-400-A	\$ 500.00
20"	500	GBK-500-A	\$ 970.00

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		Part Number	Price Per Set	Part Number	Price Per Set
B206, HS06	6"	KT-60HJ2-U	\$289.25	KT-60HJ2-X	\$301.96
B208, HS08	8"	KT-80HJ2-U	\$346.67	KT-80HJ2-X	\$368.06
B210, HS10	10"	KT-100HJ2-U	\$396.18	KT-100HJ2-X	\$436.01
B-12	12"	KT-120HJ2-U	\$461.37	KT-120HJ2-X	\$488.95
B-212, HS12	12"	KT-128HJ2-U	\$460.11	KT-128HJ2-X	\$489.97
B-15	15"	KT-150HJ2-U	\$594.26	KT-150HJ2-X	\$653.06



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- Plain back

Size	Thru Hole	Part Number	Mfg's List	Our Price!
6"	1.654"	BI-7866-0600	\$ 1,163.25	\$ 1,057.50
8"	2.165"	BI-7866-0800	\$ 1,272.15	\$ 1,156.50
10"	2.992"	BI-7866-1000	\$ 1,443.42	\$ 1,312.20
12"	4.055"	BI-7866-1200	\$ 2,143.35	\$ 1,948.50
16"	5.354"	BI-7866-1600	\$ 4,349.07	\$ 3,953.70



JAW BORING RING

A Faster, Easier & Accurate Way To Bore Soft Jaws!



- Ideal for machining soft jaws
- Attaches quickly without tools
- Bore jaws in a single operation
- Reduces set-up time
- Allows for through boring of jaws

Chuck Dia	Part Number	Price
4"	JBR-04	\$176.58
5"	JBR-05	\$176.58
6"	JBR-06	\$200.83
8"	JBR-08	\$246.86
10"	JBR-10	\$278.68
12"	JBR-12	\$309.81
15"	JBR-15	\$465.50

Fits Kitagawa, Samchully, Strong, TMX, MMK, Howa, SMW, Seom, Autoblock and other CNC chucks!

COLLET PADS & TOP JAWS



"S" Style • Warner & Swasey • Emergency Pads
Serrated, Squares & Hexes • Top Jaws • Made in the USA!

Warner & Swasey Collet Pads

Prices Starting At:
\$75.65
Set

Part # CP-WS3RM02500-Y

"S" Style Collet Pads

Prices Starting At:
\$76.73
Set

Part # CP-S12RM02500-Y

Top Jaws For 8" CNC Chucks

Prices Starting At:
\$635.25
Set

Part # CPJ-KT0800WS4-U

LATHE TOOLHOLDER BUSHINGS



- Type C, Z, J, LB, LBF, B & Boring Bar Sleeves!
- Concentric ground & diamond polished
- Wrench flats for easy removal
- "Easy Entry" feature on OD
- Large variety available

TYPE J
Starting At:

\$45.08
each

Part # TBJ-07-0250-B

TYPE C
Starting At:

\$58.80
each

Part # TBC-07-0250-B

TYPE B
Starting At:

\$48.02
each

Part # TBB-07-0375-B



5C COLLET STOP



- Fits standard 5C collets with internal threads
- 6 hardened steel stop rods included-1/16", 1/8", 3/16", 1/4", 3/8", 3/4"
- 3/4" stop rod keeps parts square to spindle axis
- Proprietary locking system prevents the possibility of the stop rod slipping in the body
- Body is red anodized 6061-T6 aluminum
- Body fits a 7/8" wrench

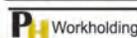
NEW ITEM!

5C COLLET STOP

Part # EDGE-45000

Mfg's List: \$49.99

\$34.27 ea



16C & 3J COLLETS

With Internal Threads



- Crafted to exacting standards from alloy steel
- Heat treated threads and spring tempered body for accuracy and long life
- Internal threads for use with threaded collet stops
- Large variety of round, hex and square sizes
- **EMERGENCY COLLETS** also available in 5C, 3J & 16C

16C & 3J ROUND Collets
\$59.00 ea

16C & 3J SQUARE Collets
\$74.00 ea

16C & 3J HEX Collets
\$69.00 ea



5C STEP COLLETS



- For OD workholding
- Allows for large diameter parts to be held in 5C collets
- Soft face for easy machining
- Diameters from 2" to 6"

Head Dia	Part Number	Price EA
2"	550-002-PH	\$45.16
3"	550-003-PH	\$52.42
4"	550-004-PH	\$76.40
5"	550-005-PH	\$109.90
6"	550-006-PH	\$128.34



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- SM Chipbreaker- Medium cutting of mild steels and stainless

Insert No.	Rad.	Grade	Chip-Breaker	Application/ Material	Part Number	BOX QTY EACH
CNMG431	.015	AH120	TM	Super Alloys	TO-1285	\$8.94
CNMG432	.031	AH120	TM	Super Alloys	TO-1364	\$8.94
DNMG431	.015	AH120	TN28	Super Alloys	TO-1727	\$12.21
DNMG432	.031	T6130	SM	Stainless	TO-6805431	\$12.21
VNMG331	.015	AH905	HMM	Super Alloys	TO-6859407	\$11.55
VNMG332	.031	AH120	TM	Super Alloys	TO-3194	\$11.55
WNMG431	.015	AH120	TM	Super Alloys	TO-3277	\$8.94
WNMG432	.031	AH120	TM	Super Alloys	TO-3338	\$8.94

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YG HI-PERFORMANCE ENDMILLS

4 Flute • Variable Helix • Made From C10 Micrograin Carbide



Ideal For Stainless, Mild Steels, Cast Iron & Low/Medium Hard Steels up to 40Hrc

Dia	LOC	Shank	OAL	Part Number	Price EA
1/8	3/8	1/8	1-1/2	YG-EMUGMF68901	\$ 13.51
1/4	3/4	1/4	2-1/2	YG-EMUGMF68905	\$ 23.07
3/8	7/8	3/8	2-1/2	YG-EMUGMF68907	\$ 38.02
1/2	1	1/2	3	YG-EMUGMF68909	\$ 58.42
5/8	1-1/4	5/8	3-1/2	YG-EMUGMF68911	\$ 117.96
3/4	3/4	3/4	3	YG-EMUGMF68048	\$ 150.07
1	1-1/2	1	4	YG-EMUGMF68913	\$ 272.90

WOODRUFF KEYSEAT CUTTERS



- High speed steel
- Straight tooth
- 1/2" diameter shank
- Right hand cut
- Staggered tooth and cobalt also available

Am Std#	Dia	Width	OAL	Part Number	Price
202	1/4"	1/16"	2-1/16	KEO-62010	\$26.91
303	3/8"	3/32"	2-3/32	KEO-63030	\$26.91
204	1/2"	1/16"	2-1/16	KEO-62040	\$26.91
304	1/2"	3/32"	2-3/32	KEO-63040	\$26.91
405	5/8"	1/8"	2-1/8	KEO-64050	\$27.18
806	3/4"	1/4"	2-1/4	KEO-68060	\$28.48
608	1"	3/16"	2-3/16	KEO-66080	\$34.02

COOLANT-THRU BORING BARS

SCLCR/L Bars Using CCMT21.51 Inserts



- Coolant-thru hole design
- Chrome nickel
- 90° boring & facing with 95° approach
- Uses CCMT 21.51 inserts (not included)

Shank	OAL	Min. Bore	RIGHT HAND	LEFT HAND	Price EA
1/4	3.00	.330	MI-200821	MI-200822	\$ 69.65
5/16	4.00	.380	MI-200823	MI-200824	\$ 71.50
3/8	4.50	.490	MI-200825	MI-200826	\$ 74.60
1/2	5.00	.630	MI-200827	MI-200828	\$ 77.75
5/8	6.00	.775	MI-200829	MI-200830	\$ 83.10

SOLID CARBIDE ENDMILLS



- 4 flute, single end
- TiAlN Coated
- Center cutting
- 30° helix, right hand

Dia	LOC	Shank Dia	OAL	4 Flute TiAlN Coated	Price Each
1/8"	1/2	1/8	1-1/2	MO-EM001067-4	\$ 7.40
3/16	5/8	3/16	2	MO-EM001107-4	\$ 11.34
1/4	3/4	1/4	2-1/2	MO-EM001137-4	\$ 14.19
5/16	13/16	5/16	2-1/2	MO-EM001153-4	\$ 18.30
3/8	1	3/8	2-1/2	MO-EM001177-4	\$ 21.90
1/2	1	1/2	3	MO-EM001207-4	\$ 35.58
5/8	1-1/4	5/8	3-1/2	MO-EM001226-4	\$ 66.51
3/4	1-1/2	3/4	4	MO-EM001244-4	\$ 88.88

CARBIDE DRILLS

STUB LENGTH • TiAlN Coated

- 135° drill point
- Right hand cut
- Made from premium submicron carbide with 10% cobalt
- For steels, stainless, titanium & nickel alloys

Size	LOC	OAL	Part Number	Price
3/64	1/2	1-1/2	SRTA-3/64-MO	\$10.04
1/16	5/8	1-5/8	SRTA-1/16-MO	\$10.12
7/64	13/16	1-13/16	SRTA-7/64-MO	\$10.80
1/8	7/8	1-7/8	SRTA-1/8-MO	\$10.82
3/16	1-1/8	2-3/16	SRTA-3/16-MO	\$14.68
1/4	1-3/8	2-1/2	SRTA-1/4-MO	\$22.66
3/8	1-13/16	3-1/8	SRTA-3/8-MO	\$44.26
1/2	2-1/4	3-3/4	SRTA-1/2-MO	\$77.94

COMBINED DRILL & COUNTERSINKS



- Plain type
- 60° angle
- HSS or M42 cobalt
- Additional sizes available

Size	Body Dia	Point Dia	OAL	HSS M2	Price
#1	1/8"	3/64	1-1/4	MAG-1150100	\$5.85
2	3/16"	5/64	1-7/8	MAG-1150200	\$5.94
3	1/4"	7/64	2"	MAG-1150300	\$6.30
4	5/16"	1/8	2-1/8	MAG-1150400	\$6.48
5	7/16"	3/16	2-3/4	MAG-1150500	\$10.22
6	1/2"	7/32	3"	MAG-1150600	\$15.12
7	5/8"	1/4	3-3/4"	MAG-1150700	\$22.14
8	3/4"	5/16	3-1/2"	MAG-1150800	\$34.29



HAND PADS

- 6" x 9" size
- Scotch-Brite™ material never rusts and can be used with water solvents
- For cleaning, deburring or finishing by hand

7447 20/ct ONLY \$18.00!

Mfg Ref.	Description	Color	Pkg Qty	Part Number	Pkg Price
7447	Gen. Purpose Hand Pad	Maroon	20	3M-04029-5	\$ 18.00
7447B	Gen. Purpose (Bulk)	Maroon	60	3M-04229-9	\$ 73.18
6444	Extra Duty Hand Pad	Brown	20	3M-16553-0	\$ 31.43
6448	Light Duty Hand Pad	Dark Gray	20	3M-16555-4	\$ 28.55
7440	Heavy Duty Hand Pad	Tan	20	3M-04050-9	\$ 36.02
7445	Light Duty Cleansing Pad	White	20	3M-16976-7	\$ 27.44

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- The top choice for high performance and durability
- Finish, debur or polish metals and composites
- SC-Silicon carbide
- AO-Aluminum oxide
- 6,000 max RPM



OD x W x AH	Density	Mineral Type	Grade	Part Number	Price Each
6" x 1/2" x 1"	8	SC	Fine	3M-09548-6	\$ 53.58
	9	SC	Fine	3M-05790-3	\$ 53.58
6" x 1" x 1"	8	AO	Medium	3M-13617-2	\$ 75.01
	8	SC	Fine	3M-09549-3	\$ 75.01
	9	SC	Fine	3M-05132-1	\$ 75.01



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- Recessed pocket for easier lifting
- Thru-body chip evacuation
- Same bed height as D688
- 4 bolt stationary design fastens from the top



SAVE \$122.00!
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 6" Vise w/ 9" Opening
 Mfg's List: \$721.00
\$599.00 each
 Part # KURT-DX6

ALUMINUM 10 PACK VISE JAWS



- Fits KURT Dx6, D688 and other standard machine vises
- Machinable aluminum- customize jaws for your application
- Buy the 10 pack and save BIG!
- Made in USA

FREE SHIPPING!
 Prices Starting At Only \$16.05 per pair!
SAVE UP TO 15%!

Length	Height	Width	Part Number	Reg. Price	PROMO!
6"	2"	3/4"	VJ-601-10	\$187.70	\$160.52
6"	2"	1"	VJ-602-10	\$208.40	\$178.20
6"	2"	1-1/4"	VJ-603-10	\$246.50	\$210.77

CAT-40 BALANCED TOOLHOLDERS

- KINGSTON:** Balanced to 15,000 RPM @ g6.3
SPIN TRU: Balanced to 20,000 RPM @ g2.5
- Balanced on a HAIMER machine
 - Includes certificate of balancing
 - Runout 0.0002" TIR or better
 - Manufactured to ISO 9002 standards
 - Traverse ground taper to AT3 specs
 - H5 bore tolerance
 - Collet chucks, Shell mill, Jacobs/ Morse Taper holders available



BUY 10 OR MORE-GET 10% OFF!



CAT-40 BALANCED COLLET CHUCKS

- KINGSTON:** Balanced to 15,000 RPM @ g6.3
SPIN TRU: Balanced to 20,000 RPM @ g2.5
- Balanced on a HAIMER machine
 - Includes certificate of balancing
 - Runout 0.0002" TIR or better
 - Manufactured to ISO 9002 quality control standards
 - Traverse ground taper to AT3 specs
 - H5 bore tolerance
 - Collet chucks, Shell mill, Jacobs/ Morse Taper holders available



BUY 10 OR MORE-GET 10% OFF!

Collet Series	Proj	BALANCED TO 15,000 RPM		BALANCED TO 20,000 RPM	
		KINGSTON Part Number	Price Each	SPIN TRU Part Number	Price Each
ER 16	2.50"	C40-16ER250-K	\$ 91.94	C40-16ER250-KB	\$102.39
	3.12"	C40-16ER312-K	\$ 94.81	C40-16ER312-KB	\$102.39
ER 20	2.50"	C40-20ER250-K	\$ 90.69	C40-20ER250-KB	\$102.39
ER 25	4.00"	C40-25ER400-K	\$ 94.81	C40-25ER400-KB	\$101.74
ER 32	2.50"	C40-32ER250-K	\$ 94.81	C40-32ER250-KB	\$102.39
ER 32	4.00"	C40-32ER400-K	\$ 94.81	C40-32ER400-KB	\$101.74
ER 40	2.50"	C40-40ER250-K	\$ 94.81	C40-40ER250-KB	\$102.39

TOOLHOLDER TIGHTENING FIXTURES



- Change retention knobs, collets, drills and end mills quickly
- For CAT & BT taper toolholders
- Crafted from 6061 anodized aluminum
- For vertical or horizontal use

Taper	Part Number	Mfg's List	Our Price
CAT/BT 40	TF-4001-K	\$ 89.00	\$ 74.99
CAT/BT 50	TF-5001-K	\$ 110.00	\$ 93.50

RETENTION KNOBS

Your VALUABLE Machine Deserves A Premium Knob!



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10% OFF!
 10 or more knobs

- Individually Magnetic Particle Tested
- Made in the USA!
- LARGE VARIETY Available!
- Made of 8620, Heat Treated to Rc 56/58
- Exceeds Industry Standards For Tolerance (ANSI, DIN, JMTBA)



Machine	Thread	Head Dia	Angle	Coolant	Part Number	Price EA
Fadal BT40	M16-2.0	.740	90°	No	B40-4501S	\$ 18.61
HAAS BT40	M16-2.0	.590	45°	Yes	B40-4500H	\$ 23.94
HAAS CAT40	5/8-11	.589	45°	No	C40-4501S	\$ 18.61
Fadal CAT40	5/8-11	.740	45°	No	C40-4500S	\$ 15.96
Okuma CAT40	5/8-11	.589	60°	No	C40-6000S	\$ 18.61
Mazak CAT40	5/8-11	.740	45°	Yes	C40-4500H	\$ 16.54
Mori Seiki CAT50	1-8	.905	90°	No	C50-9000S	\$ 22.94

EDGE TOUCH OFF GAGE



- Accurately establishes tool length offsets for CNC milling machines
- The contact face is lightly spring loaded to protect against overrun
- Contact face diameter is 0.250"
- Rectangular base fits between vise jaws on a pair of parallels
- Offset height 4.000 in (101.6mm)
- Large 2.2" easy to read indicator face
- Easy calibration check using 1-2-3 blocks
- Gage graduations 0.001"-repeatability 0.0002"
- Body and contact face are red anodized 6061-T6 aluminum
- Base: 2.4" wide x 1.3" depth x 4" height
- Padded case and manual included

TOUCH OFF GAGE

Part # EDGE-52000
 Mfg's List: \$134.99

\$114.27 ea



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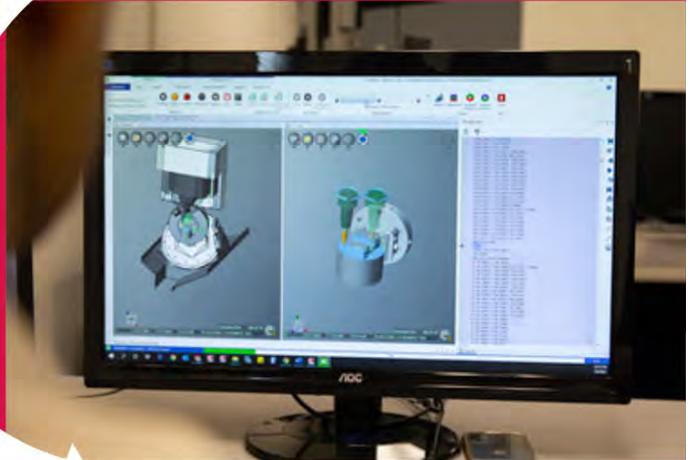
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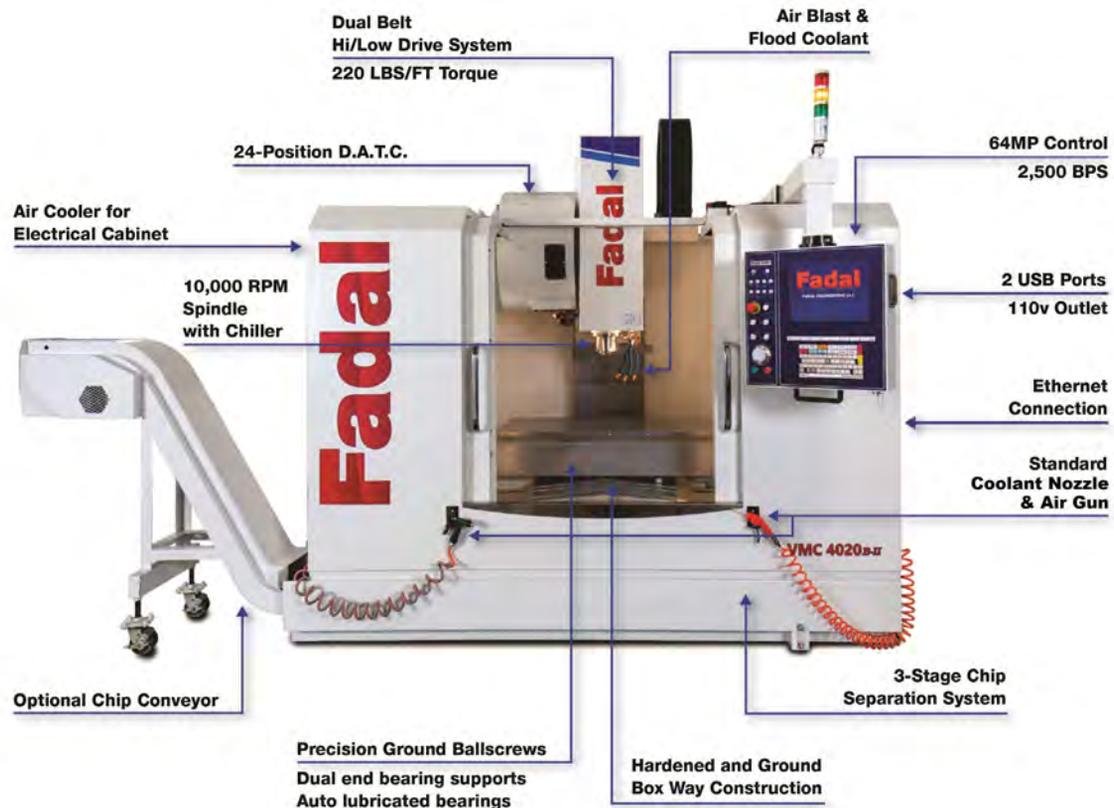
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- Best in class 220 lbs/ft spindle torque
- Dual supported & pretensioned ballscrews
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- High speed software
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- Live and Static tools offered in coolant through, adjustable, and multi-output.



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Boeing Demonstrates Multi-Domain Data Fusion and Automated Software Deployment in JADC2 Lab



Boeing recently conducted a virtual demo from its Joint All Domain Command and Control (JADC2) Lab that successfully combined data from different sources for multiple platforms across domains to create a common operating picture.

Boeing software engineers demonstrated how the JADC2 Lab’s ‘data fabric’ could combine real-time sensor data from Liquid Robotics’ Wave Gliders located in Hawaii and California with Automatic Identification System (AIS) ship data from the DoD’s Unified Data Library. The JADC2 Lab data fabric is a set of capabilities, host data services and products to contribute to a common operating picture for all users.

During the demonstration, the position data from the Wave Gliders, which are long-duration Unmanned Surface Vehicles (USVs), as well as sensed AIS tracks were shared with a simulated E-7 Wedgetail operator, while E-7 data was shared with the JADC2 Lab to form a common operating picture.

“The ability to share any data across systems, domains and providers will be critical in the interconnected battle space,” said Gerrin Inman, a Boeing software engineer and the JADC2 Lab demo team lead. “Resources are constrained at the tactical edge due to Size, Weight and Power (SWaP) considerations, but the JADC2 data fabric ensures

that warfighters at the tactical edge have the latest capabilities and insights informed by the AI algorithms and data sets of the entire network.”

The demonstration also achieved another important objective: to show how Boeing’s Nostromo DevSecOps pipeline could detect a bug in the operational software and deploy an automated update to the E-7’s Mission Systems. In the hypothetical scenario, a bug in the data code resulted in the E-7 operator seeing inaccurate ship location information. The E-7 operator reported the issue to an operations center, represented by the JADC2 Lab, which then leveraged Boeing’s DevSecOps pipeline to fix the bug and deploy an automated update. The entire process caused minimal disruption to operators and downstream users.

While the OMS-heavy E-7 was the primary platform in the simulated scenario, the possibilities for sharing data and common operating pictures between multi-domain systems is endless – from sensor to sensor, to platform, to shooter. Boeing’s focus on open architecture and DevSecOps provides warfighters with modern tools and capabilities for software development at the speed of relevance.

“What we’ve demonstrated is the future of warfighting, which will only continue to evolve away from a platform or system-based approach and towards the internet of military things,” said Scott Dickson, Boeing’s director of Multi-Domain Integration. “If you can push updates to a system confidently and in real time without having to take it out of service, the result is greater mission readiness.”

Over the last two years Boeing has successfully conducted flight tests marrying the OMS-compliant battle management command and control (BMC2) system to Northrop Grumman’s advanced, wide-band active electronically scanned array (AESA). These successful airborne tests of our OMS architecture are key steps in validating our approach and moving the product to fielding.

Located at the Boeing Developmental Center in Tukwila, Wash., the JADC2 Lab provides a location to integrate, rapidly prototype, and mature joint solutions while adhering to open architecture consistent with the DoD’s approved tech stack. Boeing stood up its JADC2 Lab in 2020 as the Air Force started up its Battle Lab.

INTRODUCING

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E-40



E-90



EVERY DAY IS A MARATHON AT AR MACHINE CORP.

Richmond, Ca. based AR Machine Corp is a relatively new player to the game. The 3,000 sq.ft. shop sits right off the waterfront and is making a name for themselves in the world of one off, high complexity parts manufactured from exotic metals. The Bay Area has no shortage of manufacturing, but Austin Roche is driving business by the seemingly simple idea of delivering quality parts, on time.

Austin is a self-taught machinist who got his start building mini steam engines at home. "I just always

liked making stuff," tells AR Machine Corp. founder Austin Roche. "I like the process more than the result sometimes, but I was always working on cars and things like that.

My dad helped foster my love of machining and bought me a bench lathe from an estate sale when I was a kid. I just made a ton of things on it for fun." San Francisco

Article & Photos by *Sean Buur*

AR Machine Corp. are known for their ability and desire to do onesie and twosie parts with a high complexity level and made from exotic materials. Their customers are in robotics, aerospace, and automotive. They also manufacture for local government labs, drone, rocket and satellite companies. 5 axis precision machining paired with on time delivery and great customer service are earning Austin and his team a great reputation.



has a world class science and technology museum called the Exploratorium, and after school Austin continued his hands on education as part of their build crew. “I know we want to talk about my shop, but if you’ve never been to the Exploratorium, it is amazing,” continues Austin. “They have great exhibits, it’s on the water at Pier 15, just a fantastic place to go. I was part of a team working behind the scenes on the exhibits. Milling, turning, welding, fab, design, engineering; it encompassed a ton of different skills.” Austin made connections with like-minded people that led to jobs at local tech companies. “I got a position at Google machining on their X projects,” details Austin. “That led to a job at Uber working on their self-driving big rigs. The projects were super cool, but mainly I was there gaining experience. The money was good, but at some point, I was like I’m going to just buy my own Haas VF2 and see where that takes me. I was living for cheap on a sailboat and saving as much money as I could to get that machine. I rented a space in another shop and thought I

would just be a guy in the back of a shop making stuff for years. I had connections from the jobs I had that were willing to send me some work. I figured it would be a few parts here and there and I would use the Haas like an expensive hobby machine to do my own thing on.”

Things escalated quickly and 2.5 years later AR Machine Corp. has four employees, five machining centers and 3,000 sq.ft. of manufacturing area. The first year in business Austin made more money than he had before, reinvesting it back into the company by adding an employee and a used Doosan lathe. “I said yes to everything and was getting these really complex parts,” tells Austin. “I was quoting and actually getting the jobs, so the VF2 got an upgrade by adding a 5th axis trunnion. I also purchased a 5 axis Haas UMC 500. I struggled through it, a lot of times having no idea how the best way to produce the parts. I turned to the internet. Honestly, YouTube is such a great reference for learning. I taught myself how to program and machine from watching videos. I never went to college and find it to be outdated with the internet as it is. If you want to expand your knowledgebase, you can basically learn anything you want. I wanted to learn how to do 5 axis machining and I did. You are only limited by your desire to learn.”



Left - AR Machine Corp added the 5 axis Matsuura right before Covid took hold in the bay area. Having a pallet pool and a Japanese machine were two important items on Austin's wish list for his growing company. Middle - Realizing the value of a palletized machine Austin recently purchased a used Matsuura horizontal for lights out production runs.

Austin landed a big mold account entailing precision levels twice the normal level required by most of his customers. He knew he needed a machine that could handle the current demands and demands down the road. "I knew I wanted to get a higher end Japanese machining center with a pallet pool," details Austin. "The Matsuura seemed like a brand that offered a lot of value for what

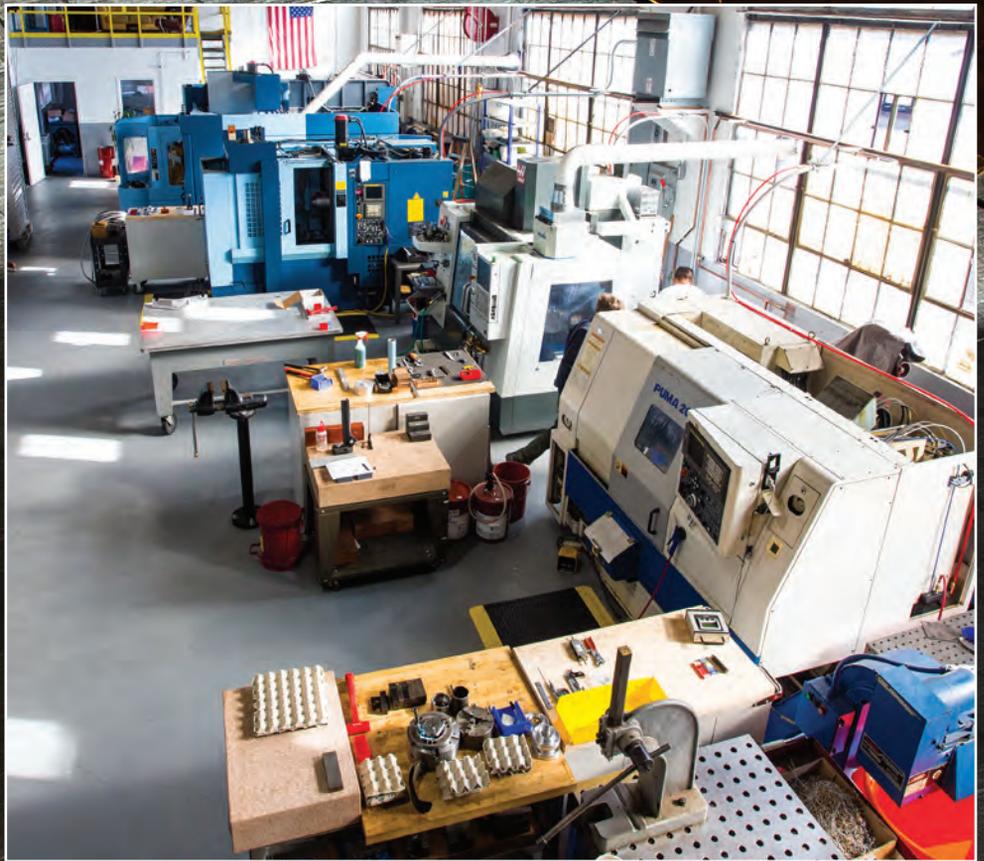
you get. With the MX520 pc4 you get 5 axis machining, four pallets and compared to similarly sized machines it has a large work envelope. Andrew Selway of Selway Machine really treated me well. It was right before all the Corona Virus really hit the Bay Area, so Selway sold it to me at a great price. As you can imagine it came with a higher price tag than buying my first VF2. None



of it would have been possible without Quick Turn Financial and Selway. Janna at Quick Turn is so awesome. They loaned me so much money to get the machines I needed to expand. They specialize in the manufacturing industry and will do loans for new and used equipment. As a young company it isn't always easy to find companies who believe in you and shares your vision, I'm very glad I found two."

Austin touts how the Matsuura pallet pool was money well spent. As a job shop with a diverse customer base the pallet system allows him the flexibility to be as hands on or hands off as needed. "We mostly run one or

Austin dove into 5 axis machining by adding a 5th axis trunnion to his Haas VF2 the second year he was in business.



Right - AR Machine Corp. moved into their current workspace four months ago after doing a huge renovation on it. They did everything from sandblasting to concrete to reduce the rent. Their building was an old generator room during WW2 for the munitions factory next door. It houses two Matsuura mills, a Doosan lathe, a Nakamura-Tome lathe, and a Haas mill.

two prototype style parts,” explains Austin. “Our typical customer is in robotics, aerospace, and automotive, but more and more jobs are coming from a local government lab and companies who make drones and shoot satellites or rockets into space. The pallet pool on the Matsuura MX520 is essential to our workflow. Versatility is key. I can work on multiple jobs simultaneously and still be able to take on a rush order without missing a beat. It makes no difference if it is a one-off part or a run of 50, the pallet pool has plenty of room for anything I need to do. As an example, we might figure out how to run a complex production part during normal business hours and say it takes 4 hours to machine. We then set the Matsuura loose, operating lights out over the course of the next few days. It is like free money coming in the next morning and seeing three finished parts ready to be unloaded. I like the pallet system so much that I just picked up a used Matsuura ES 450h horizontal to increase our lights out productivity. Again, for the price Matsuura offers a lot of features and high accuracy.”

Austin attributes AR Machine Corp’s success to a mixture of right place/right time, taking on jobs others don’t want, and delivering exactly what was promised. “I think companies are having a hard time finding places that do-good work, day in and day out,” explains Austin. “I’m not saying we do good work as a brag, lots of companies

are making great parts, but so are we. Dependable machine shops are busy and growing. We tripled our space moving here four months ago, and I am already seeing how we will outgrow the space before our lease is up. It is a good problem to have, but I need more people to program and run more machines and that’s hard to find. I can’t afford to compete with big tech that pays their people insane amounts of money, so we are training from within. I have three full time people and myself right now and could use more. The good part of in-house training is that I can teach them my bad habits, but at least they are mine, so I know what I’m getting. Our customers like our quality, the service and the pricing we offer. They also like that we embrace prototype projects. It’s hard to find reliable shops that want to run one or two parts. Most manufacturers want the production job because they are easier. I would like to have a little more production running too, but only overnight while we are gone. We love the challenge of figuring out how to make a single part out of expensive materials. It is fun and exhausting all at the same time. The prototype stuff is almost like manual machining. At the end of the week, I feel like I ran a marathon, every day.”



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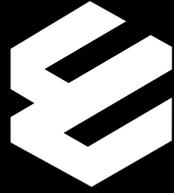
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Aviation Startup ZeroAvia is Building an R&D Center Near Seattle



ZeroAvia, a green aviation company with backing from tech giants and major airlines, is building a research-and-development space north of Seattle at Everett's Paine Field.

The location is notable as the home of century-old aerospace heavyweight Boeing, as well as to fellow electric plane upstart MagniX, which moved into a new manufacturing building in the area one year ago.

And it may be the start of a bigger Washington state presence for ZeroAvia. While the current project is focused on R&D, ZeroAvia will need to build a manufacturing facility in the near future in order to start rolling out its hybrid hydrogen-electric powertrains for customers in 2024.

ZeroAvia is developing powertrains for aircraft, starting with propulsion systems for 10-to 20-seat planes with a more than 500-mile range that could be used for passengers, package delivery, agriculture and other uses. It plans to keep scaling up the size of its powertrains, with the ultimate goal of powering aircraft with more than 200 seats.

At Paine Field, the company is converting warehouse space into offices and R&D facilities. The Washington Department of Commerce awarded a \$350,000 economic development grant to help fund the project. The company is spending an additional \$5.5 million to refurbish the location, with more investment to come. The site will initially employ 20 to 30 people.

In Everett, ZeroAvia will be operating alongside Alaska Airlines in a space that could occupy tens of thousands

of square feet. The Seattle-based airline this fall provided the startup with a De Havilland Q400 aircraft for the startup to outfit with its hydrogen-electric system for demonstration purposes. The plane can carry up to 76 passengers and was previously flown by Alaska's subsidiary, Horizon Air.

The new R&D site will also be used for developing technology and flight tests. That will include the Q400 aircraft and other technologies. Snohomish County is home to roughly 500 companies in the aerospace industry, creating a potential source of workers and access to a developed supply chain.

At the same time, commercial space ventures are going strong in the region, with Blue Origin's headquarters based south of Seattle and SpaceX expanding its operations in the area.

As the world tries to slash its carbon emissions, the aerospace sector is pursuing various avenues for decarbonization. In addition to burning carbon-emitting fossil fuels, traditional aircraft produce heat-trapping nitrogen oxides and contrails. To reduce those impacts, companies are exploring alternatives including battery-powered electric aircraft and hydrogen fuel.

MagniX is focused on all-electric flight and recently won a \$74.3 million grant from NASA to demonstrate its technology. It has a deal with Vancouver, B.C.-based Harbour Air to create a fleet of retrofitted electric seaplanes certified for short-haul passenger flights, and partnerships with other small airlines.

ZeroAvia will be conducting flight tests in the United Kingdom with this 20-seat, hydrogen-electric powered plane in early 2022. In the meantime, many airlines are pursuing Sustainable Aviation Fuel or SAF, which are fuels produced from non-fossil fuel sources, such as oils from plants and animals and agricultural waste. SAF is also in limited supply and has climate impacts but can be used in existing aircraft.

ZeroAvia, which launched in 2017, has R&D sites in Hollister, Calif. and Cotswold Airport in the United Kingdom.

ZeroAvia's goal for 2025 is to start building ZA-2000 powertrains for aircraft that can carry 40 to 90 passengers, with plans to deliver those systems to customers in 2026.

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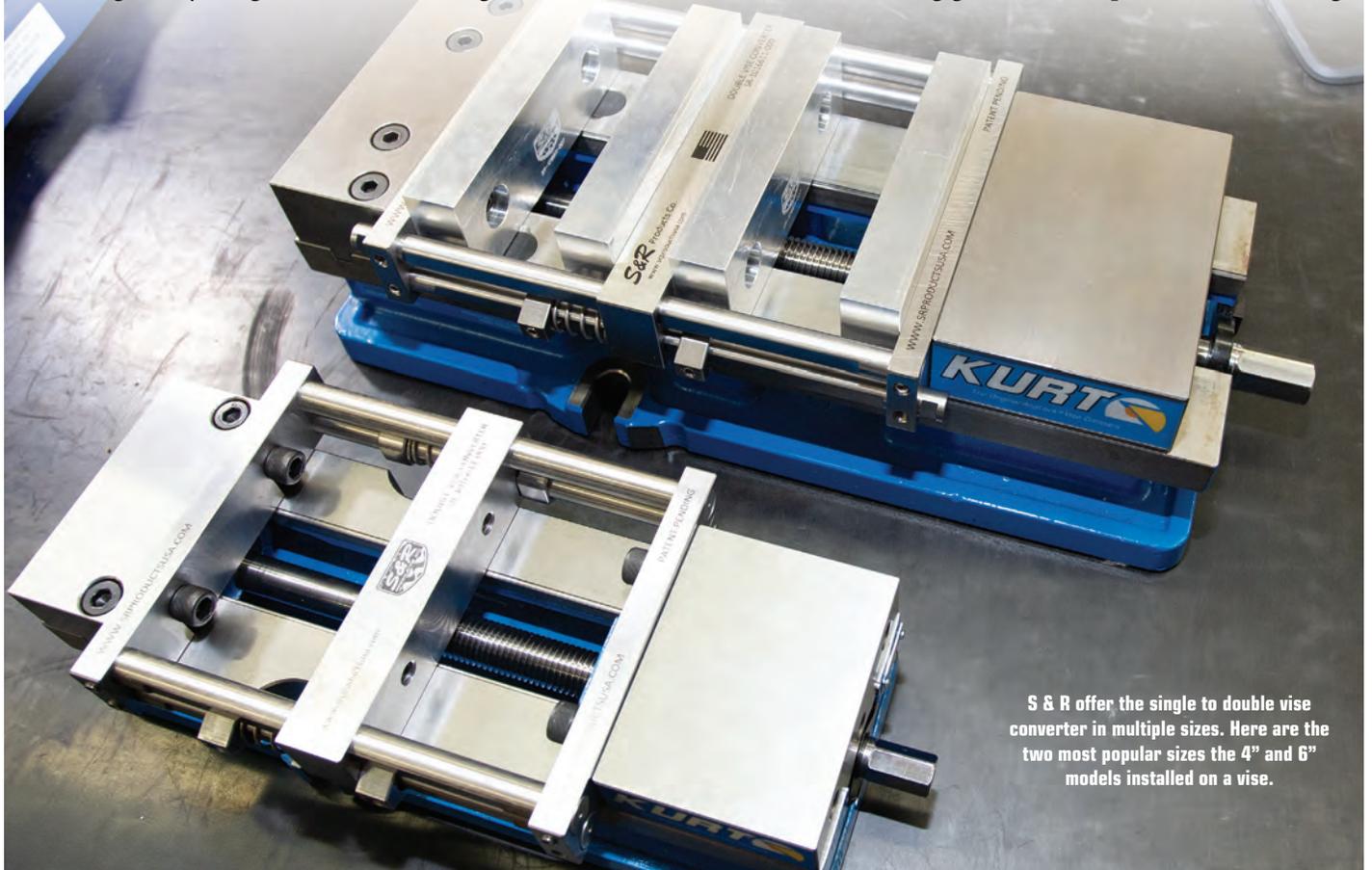
SINGLE TO DOUBLE VISE CONVERTER IS CONVERTING COMPETITORS INTO CUSTOMERS

Article by: CNC West - Photos by: CNC West & Provided by S & R Products Co.

Valencia, Ca. based S & R Products Co is a company focused on building strong and reliable tools for the manufacturing industry. Using high quality materials and aerospace practices, their products are proudly made in the USA and designed by machinists, for machinists.

The origin story of S & R is one for the ages, and probably impossible in 2022. Salvador Ramirez immigrated to the United States and began a career as a machinist. He spent years working for other people in various shops throughout Southern California. In 1994 Salvador was basically running a company for an absentee owner when he was approached by a buyer with an interesting proposition. "My dad tells the story of a buyer asking him one day if he was one of the owners since it seemed he was doing everything from order taking and customer

service to running the machines," tells Oscar Ramirez, president of sales/marketing and Salvador's son. "Dad said no, and the guy asked if he wanted to own his own company. If so, they would just go directly to him for all their work since he was doing it anyway. Long story short dad didn't have the money to open a CNC machine shop, but with this supplier's reputation and signed contracts in hand, the buyer got us hooked up with the right machinery dealers who financed the equipment and even helped find a building to put them in. With us as their new manufacturer pricing was better, they had job priority, and my dad was a business owner. Mr. Martinez has since retired, but he made it all happen and almost 30 years later we are still thankful. Personal relationships like that are so rare now, seems impossible, but that is how S & R CNC Machining got into aerospace manufacturing."



S & R offer the single to double vise converter in multiple sizes. Here are the two most popular sizes the 4" and 6" models installed on a vise.

As an aerospace parts manufacturer, S & R know their way around precision. All S & R items are manufactured in house to the same stringent standards and protocols as their everyday work. Here a single to double vise converter is being used for the first op and second op on their S & R Products Co socket.





S & R's manufacturing center in Valencia, Ca. is 8000sq.ft. and filled with 14 CNC machining centers from Haas and Doosan.

The aerospace game is competitive, and to be in it three decades you've learned a few things over the years. It's difficult to think about your future while at the same time honoring your legacy. But that's exactly how S & R came to the point of releasing their own product line of Workholding solutions. "Instead of competing for aerospace accounts we decided to put our aerospace manufacturing experience into designing, building, marketing and selling a unique work holding solution that we used to increase our productivity," details Oscar. "We launched S & R Products Co in June 2021 with the intent of making competitors into customers. Our flagship product is the patent pending double vise converter for 4" and 6" vises." S & R also manufacture high quality tool holders, tool organizers, tool changers, sockets, wrenches, chucks and soft jaws, but hands down the double vise converter is their pride and joy. "The double vise converter is the biggest seller and is a product that really changes how you utilize a vice," continues Oscar. "Work holding is an artform, sometimes voodoo, but always is essential when it comes to delivering a quality

product. Nine years ago, we designed and built a device that converts your single vise into a double vise within a couple minutes utilizing a patent pending design and 4 bolts. As far as we know there is nothing else like it on the market. We've spent the last ten years testing it in our own aerospace manufacturing facility to improve production and increase throughput."

The S & R single to double vise converter does just what the name suggest. It turns your single vise into two. Sure, there is no shortage of double vises on the market, but product specialist Richard Morris is quick to point out some advantages to the S & R product line. "First off is price," explains Richard. "Our converter is a value and will work in conjunction with the vises you already have. Our double vise converter is very light and comes on and off in a matter of minutes with only 4 bolts. Changeover is crazy fast, and crazy easy. Our double vise converter takes on the traits of the vise it is mounted to. So, if you have a brand-new Kurt vise, it shares that quality and repeatability. Our double vise converter doesn't have a fixed center like a standard double vise. It uses

more of a sandwich method that offers a lot of creative ways to hold parts. We have many demonstration videos on our website."

S & R exhibited at Westec 2021, as part of their brand launch. Day after day, demo after demo, it was a great opportunity to introduce a lot of people to their products in a short period of time. "We are machinists at heart, so we are learning as we go the best way to showcase our products," tells Oscar. "We are building the brand through shows, online sales and a growing distribution network. We have 35 distributors in the US, Mexico and Canada as well as a dedicated team on the east coast pushing product in the field. We've partnered with



S & R Products quality lab is set to handle the latest in ISO9001 and AS9100 requirements.

S & R Products tool tray is available in 30mm and 40mm versions.



S & R Products sockets are machine specific and heat treated to 38-42 Rockwell.

S & R Products wrench has a socket specific end and a standard 3/4" end for most standard vises.



companies that are in the business of customer service, and not just order processing. The other thing we've found is that no one wants to stock anything. All our products are in stock ready for delivery." "We've talked a lot about the double vise converter and only mentioned our other products," adds Richard. "I know the thought of a socket, or a wrench isn't as exciting and not as unique, but they go above and beyond what people think of in a quality tool. Anodized, and heat treated are not words that usually go hand in hand with a socket and a wrench. We are proud of the fact that we do our manufacturing right here in Valencia, California, USA. As an aerospace manufacturer we know the importance in Made in the USA, and as a user of tools we know the value of Made in the USA too. Our tool holders hold tools just like everyone else's, but they are anodized, sized to fit in standard cabinets and have easy to use handles making them ultra-portable."

One thing is clear, S & R Products Co has a goal to deliver a luxury tool experience at a fair price. Decades of aerospace manufacturing go into their products, and it shows.



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Automation Control Feature Eliminates Need to Program Robots



A new feature developed by Hurco makes automation for high-mix manufacturing practical because it runs right on the Hurco control, eliminating the need for machinists to learn how to program robots. It provides automatic calibration to the CNC machine, making it easy to move the system between Hurco machines. It has a probe part/workholding location feature that reduces part changeover to less than five minutes for new jobs and just seconds for previous jobs.

The Automation Job Manager is only available on Hurco CNC machines and is part of the Hurco Practical Job Shop Automation package that includes the control software and hardware for CNC machine tending automation, such as the collaborative robot, dual servo grippers, collaborative auto door and more.

“While new features such as the Automation Job Manager expand the value of the Hurco control, it is the flexibility of the Hurco control powered by WinMax that helps shops improve productivity,” said a company spokesperson. “This flexibility allows customers to determine which programming method is best for each job: conversational, industry standard NC or NC/conversational merge.”

“As the inventor of conversational programming, Hurco is dedicated to continuous innovation to maintain its status as the easiest control to program and add func-

tionality that helps customers increase productivity and profitability,” added the spokesperson.

The NC side of the Hurco control follows the industry standard, which means shop personnel can use their existing programs and do not have to change their current processes.

NC/conversational merge is a feature Hurco developed that lets the user apply conversational features, such as pattern operations, scaling, tool probing, part probing and unlimited work offsets, to existing NC programs. Patterns include loop rotate, loop translate, loop linear, loop angular, pattern locations, scale and mirror image.

Whether the machinist decides to use conversational, NC or NC/conversational merge programming, there are multiple control features that are independent of the type of programming. Three such examples include Advanced Verification Graphics with 3D Solid Rendering, Data Block Search and the True Interrupt Cycle:

Advanced Verification Graphics lets the user view a solid rendering of the tool path that displays dynamic rotation, tool cut simulation and dynamic view manipulation. This feature reduces scrap and programming time and proves out the part program.

Data Block Search simplifies the tedious task of searching for a data block or line of code during the editing process. Users can easily touch the selection they need to edit right on the graphics screen, and the cursor will jump to the corresponding part of the program.

The True Interrupt Cycle eliminates the need to teach the control the path the tool takes when it retracts and returns to the part. When the Interrupt button on the control is pressed, the spindle stops cutting, the coolant shuts off and the tool automatically retracts to Z home. The operator can jog the machine in any direction to check the part or change tool inserts. Then, simply press two buttons and the cycle automatically resumes right where it left off—at the speed the operator chooses.

The integrated Hurco control provides technical specifications as standard. The Hurco control is equipped with a 128 GB solid state hard drive, 10,000 block lookahead, a 2.7GHz dual core processor, 4 GB RAM memory and an intuitive graphical user interface. All 75 models of Hurco CNC machines utilize the same control. The Hurco control is upgradeable, which allows customers to stay up to date with the latest control technologies.



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PRECISION MANUFACTURING INC.

Article & Photos by Sean Buur



Brothers Erik (left) and Ed (right) Sicairos went into business together in 2000. It's been a journey, but the path they walk now is the one they always imagined.

Brothers/owners, Ed & Erik Sicairos at Applied Precision Manufacturing Inc. (APM) in South El Monte, Ca. have gone through a few different trials and tribulations over the course of their 20+ year history. It is a cautionary, yet entertaining tale of machining, deceit, denial, fake falling outs, and a loco investor. In the last five years they've bounced back better, building the dream they imagined when they went into business together in 2000.

Since he was 24 years old, Ed Sicairos wanted to start a manufacturing company and be his own boss. He even convinced his younger brother Erik to go back to school and get the fundamentals of machining down so they could partner together in a shop. "I think he just wanted someone to take that ride with him," jokes APM co-owner Erik Sicairos. "We planned it for over a year before pulling the trigger and striking out in 2003." As Erik was learning the trade Ed was applying it as a manufacturing manager

for the automotive company B & M in Chatsworth, Ca. "I was 27, didn't know how to run a business, but was great at machining and programming," explains APM co-owner Ed Sicairos. "The idea was to pick up a mill and a lathe and for Erik to run them while we built a customer base and I still worked at B & M." They crammed two machines into a small shop in City of Industry, Ca. with Erik doing the manufacturing and Ed programming from his job at B & M. Ed didn't feel right about working on his own deal while on another company's dime. He knew he just needed to commit 100% to the new endeavor, but it was a big step and a bigger pay cut.

Ed went to the owner Bob, the B in B & M and explained the situation and guaranteed he wouldn't leave them high and dry, staying until his replacement was fully up to speed. "They seemed really happy for me," explains Ed. "It was strange. Then I got called back into the office and it became clear why that was. They were



APM's first foray into Swiss turning came within the last year. They purchased from Expand Machinery a Ganesh Cyclone 32 NCY and liked it so much they added a Ganesh Genturn-32GS which has simultaneous main & sub-spindle machining, dual C axis and a Y axis.

already set on shutting down the in-house manufacturing and selling off the CNC machines. If I wanted to buy the machines, I could have the work too. I was like what? So, I'm out of a job or I buy a shop's worth of CNC machines. Everyone in the area wanted the work, but no one wanted the machines. We got some help from our dad and figured out extra funding. The stars just aligned, but six months into being first-time business owners we now had something like 10 machines, 20 employees, a bigger building and a ton of B & M parts. We were full gas, 100% B & M, two shifts and seven days a week. What could go wrong? Machining is the hard part, running a business is easy right? It went well for years, and then we noticed that the PO's were getting lower and lower, but our nut still was the same every month. Let's just sum it up as we

learned some lessons and built back smarter and better." "We spent a decade learning what not to do as a business," adds Erik. "We always took great care of our customers, and the quality of work never faltered, but honestly we needed to be better businesspeople."

After some struggles, a family investor came along that looked to solve their problems. He did solve a few but created even more. After a long-drawn-out miserable partnership, the company dissolved. Armed now with the experience they once lacked, Erik and Ed reformed the original idea into today's Applied Precision Manufacturing Inc., owned once again by only the brothers Sicairos. "When all was settled, we needed to rebuild and this is where Harvinder Singh, of Expand Machinery really helped us out," tells Erik. "After the dust



APM have a variety of machining centers that vary in size & capabilities. With seven employees and ten CNC machining centers they still have room to grow in their 6,500 sq.ft. manufacturing center in South El Monte, California.



APM got the Toyoda horizontal to do their military and aerospace production runs that require a large amount of material removal.

settled, after wasting all that time, wasting all that money we ended up with a clean slate but only two machines, a Haas VF4 with a 4th axis and a SL20 with a C axis. We needed more machines and ended up buying a Comet, a Femco, a Takumi, and a VF6. We got everything from Expand Machinery. Harvinder went out of his way to steer us in a good direction. We told him exactly what had happened and where we felt we went wrong and where we wanted to go.” “Picking up used machines from Expand Machinery is like buying new,” continues Ed. “They are perfectly rebuilt and ready to go without the higher price point of new. The buying process was amazing. You know right away that Harvinder is in it for the long haul with you as a company. The one and done mentality you get from many machinery salespeople doesn’t exist. We are customers and friends for life, he has been that valuable in reengineering the APM program.”

Stage two for APM came about a year ago when they earned their AS9100 certification and took up Swiss turning. “One of our long-term goals from back in the day was to get AS9100 certified, and we did it finally last year,” touts Erik. “We’ve always embraced the standards as a company, but love that we now have the certifications. It is a road map; follow this guide and you will do well. We should have done it sooner.” New Aerospace customers haven’t beat down APM’s door during the pandemic, but automotive has been nonstop. That is ok by them as they continue to reinforce the AS9100 training and essentials with their team. “Not every job requires a paper trail,” explains Ed. “But we treat every job as if it does. The AS standards have improved us as a company, and we are delivering better parts because of it.”

With phase one machines paid off and APM on the rise, Ed and Erik set off in search for the next wave of machining centers that would help drive their expansion.

New clients and work orders come mostly via referrals and word of mouth so when an existing customer offered up an additional family of parts they jumped at the chance. “One of our local aerospace customers has been so impressed with how we’ve been manufacturing their large parts that they wanted to give us their smaller parts as well,” explains Ed. “Some of those parts they were actually manufacturing in house on really old screw machines. So, the POs came with three old machines. We knew we needed to call Harvinder and see what was out there to improve quality and efficiency. He took us all over the place looking at new and used machines. Ones he couldn’t even sell us, just to show us what was out there and some of the features he thought could up our manufacturing game.”

APM ended up purchasing a Ganesh Cyclone 32 NCY Swiss screw machine turn from Expand Machinery and financed it through Valley Financial. They also added a KIA turn, a Toyoda FA-450 II HMC CNC horizontal, and a dual spindle Ganesh Genturn-32CS Swiss machine, all bought with funding from Valley Financial. “The Swiss turning was something we really didn’t know a lot about and Harvinder really helped educate us on the different aspects that went along with it,” tells Erik. “We immediately saw the benefit of Swiss turning and kicked ourselves for not buying one sooner. It was a night and day difference. As soon as we got the first one, we added the dual spindle version a few months later. Our first set of parts earned us more PO’s, more parts, and larger run quantities. Once we pay off the first Gen Turn in March, we plan on adding a third Swiss machine in the summer.” “The value of buying a used machine from Harvinder, and Expand Machinery is like buying a certified preowned machine,” continued Ed. “He is the type of guy that replaces everything in it before installing it on your floor.



APM's Super KIA Turn 21Lms is a dual spindle live tooling, high speed turning center. It was purchased from Expand Machinery and financed via Valley Financial.

Looking back, I see a guy that spent a lot of time showing us options that would best benefit our business and not necessarily his. Who does that? Harvinder does, and we appreciate it every day."

APM is growing at the rate they want; with the machines they want and the customers they want. It has been a long time coming for the brothers Sicairos and quite the journey, but they are walking the path they imagined back in 2000. "2021 was the most profitable year for us as a company," concludes Ed. "We got new business, upgraded machines, and a long-term plan that includes one day handing the reigns over to our children. We are not the cheapest and not the most expensive, but you get way more than you pay for in quality and service. We take

pride in what we do. Customers see that and know it has value and recommend us to others. Verification processes tell us we make good parts, but recommendations tell us it was a job well done." "Job satisfaction doesn't just come from customers," finishes Ed. "Working with my brother all these years and having our sons as part of the company now and in the future makes APM a place Ed and I want to come to work. Ed's son Alec is our mill setup man right now and his oldest Andrew just opened an engineering and designing 3D printing company down the road. My son Erik Roy Sicairos worked with us for 8 years and is off gaining other experiences, but they know this place is theirs. It started with family and will stay with family.



Parts range is size and materials and come from the automotive, aerospace and medical industries. APM last year earned their AS9100 cert and have been expanding their aerospace customer base ever since.



Recruitment and knowledge sharing

Tim Paul

In my last article, “Machining Education – Ready for change,” I suggested that we as the machining industry take a serious look at changing what we teach and how we teach it when it comes to machining. That article was like whacking a hornet’s nest: it stirred up a swarm of great conversations full of strong opinions. My article wasn’t intended to be a complete answer to all our industries problems. It was really intended to encourage readers to question if we are teaching the right things, the right way, in the right order.

Wrapping up the last article, I said next time I would explore what we can do as an industry to attract more people into manufacturing trades, while discussing what we can do to respect, preserve, and share experiential knowledge throughout the industry. This time, I’ll share my thoughts on two main topics, recruitment and knowledge sharing.

Recruitment:

I recently read an article that said, “The funnel and pipeline that feed talent to the precision manufacturing industry has sprung a leak”. The reality is that the funnel isn’t filling up and a big percentage of people that make it into the pipeline are dropping out before they complete vocational programs. For the purposes of this article, I’ll focus on our school system and the connection to businesses. Over several decades our primary and secondary schools have focused on transferring students to four-year universities. I’m no more opposed to everyone going to college than I am to every machine shop buying a 6-axis CNC machining center. Both have huge ROI (return on investment) potential, to end up wasting big amounts of money. What can we do as an industry to better recruit people to our industry? Over the years I’ve had several business owners contact me to discuss the future of our industry. Most recently, Brian Kippen of Kad Models called me to discuss what actions could be taken at a local level to recruit and promote the trade to the community. Brian has an interesting perspective as he owns an established machine shop in California’s Bay Area as well as a new machine shop in Vermont. One of the things that stood out to me in my conversation with Brian was when he said, “Machine shops should have open house events for their communities.” He explained what he has done and how interested and engaged the community was as he opened his shop up for visitors. Brian has done a great job recruiting smart people and sharing his knowledge and experience with them to produce a highly productive team. I think Brian’s fresh look at how to engage his community and foster the next generation of machinists will continue to support his shop’s growth for generations.



Photos: Kacie Merchand / KAD Models

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“Machine shops should have open

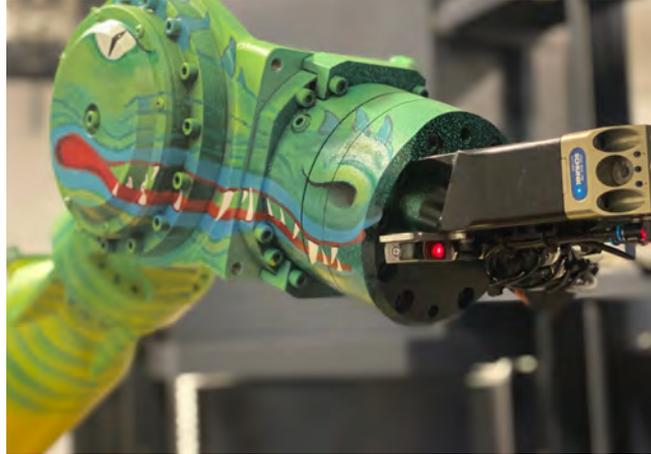
Knowledge Sharing:

I hate to sound like an alarmist, but our industry is at a very real risk of losing a large portion of our knowledge over a very short period. I am aware of several multimillion-dollar companies around the country where most of their skilled machinists will be retiring in the next 3-5 years and they have no plan in place to replace their skilled workforce. They have some engagement with local community colleges, but largely they are just hoping there is some external solution that solves their problem.

There seems to be three general groups when it comes to how companies hire and train their skilled

machinists. The first is a large group of shops that are paying big money to hire experienced machinists to be “heavy hitters” and hoping they will fill their needs. This situation is great for people who already have the skills and experience businesses are looking for as the laws of supply and demand are working in their favor. The negative is that this has essentially become a wage war, making it difficult to bring in and mentor new talent. Top paid “heavy hitters” are typically expected to be high producers on day one, which disincentivizes mentoring their junior colleagues – often compounded by the feeling that they would be training their replacement. Lastly, much like arms races, wage races typically end in expensive “wins” for some and

costly ruin for most. The second group of companies participate in their local community to help recruit and train new talent. Few thoughtfully structured or apprenticeship programs connected to their local vocational companies have great success while others see fewer returns. These activities are much like the focus and quality of the work put into them. There are select examples of companies engaging successfully to both recruit and invest in training their next



generation of workers, it just takes effort and consistency. The last group are not engaged at solving the problems ahead. There are many valid reasons why a business may not be able to make an investment in hiring and training, but these are the companies that face the biggest challenges ahead.

Closing thoughts:

It’s surprisingly hard for me to sit behind my keyboard and pick apart an industry that has been so good to me, my family, and so many friends of mine. But there is no doubt that impending challenges are ahead of us. My hope in sharing my thoughts is not to prescribe a fix-all solution or forecast total doom, but to share some action-provoking thoughts and perspectives. There are a thousand valid perspectives on this topic but without action nothing gets better. I believe most of our industry would benefit significantly by honestly reflecting on how welcoming and inclusive their workplace is to new talent, new perspectives, and new technology. I get the sense that a lot of people in our industry are feeling that their efforts to invest in the next generation of machinists would be a futile exercise. I personally feel that my efforts can make it better, but no single effort will be enough to fully turn things around. That said, if a third of the manufacturing businesses in our industry worked more closely with their communities to champion precision manufacturing, invested more in in-house mentoring, and developed stronger apprenticeships programs, maybe our future workforce outlook would take a turn towards good.



Allied Machine Donates Boring Tools to USS Pampanito Restoration

Wohlhaupter Tooling Helps Preserve World War II Submarine in San Francisco



Allied Machine and Engineerin, recently donated various boring bars and inserts to be used with a 1954 Wohlhaupter boring head on the USS Pampanito restoration project. Pampanito, a World War II submarine located in San Francisco, opened to the public in 1982. Since then, it has been the goal of the San Francisco Maritime National Park Association to return the submarine to the condition it was in when it left Hunters Point Naval Shipyard in San Francisco in 1945, representing the height of World War II submarine development.

In order to more efficiently repair and restore the submarine, an onsite machine shop was developed. Here, volunteer machinists come to the shop, which is tooled up for manual work, and repair or replicate small quantities of parts. Larger quantities of parts are often machined in CNC shops. After receiving the Wohlhaupter boring head, the museum machine shop contacted Allied Machine to see if boring bars and inserts could be donated to help further the preservation of the vessel. While the donated tools allow history to live on and fuel education, they also demonstrate that the ingenuity of boring tools still holds true today.

The donated tools will be most immediately used to bore out parts for waterproof lamp housings that are used on the submarine. These waterproof lamp housings were part of large waterproof binoculars that stayed out of the water when the submarine dove down to 300 feet. The lights enabled the crew to see the reticules or the lines that told them how wide or tall an object was or let them make calculations. Although these were missing on Pampanito, drawings were found, which makes it possible to create replicas. In the future, the donated Wohlhaupter boring tools will also be used to machine internal grooves

in bronze bearings that are used on the submarine.

Because this is an on-going restoration, three types of projects will continue to be seen in the machine shop:

- Repairing parts that are broken and need touched up to maintain the historic fabric.
- Developing replica parts for pieces that are missing from the submarine but are needed to better understand the functions of the vessel.
- Creating replica parts to replace original pieces from the submarine that break over time but are needed for safety.

Ultimately, though, Pampanito serves as a museum that educates visitors, provides the ability to research the history of the vessel and offers a historic artifact to preserve and restore. Simply stated, having the actual submarine provides many more opportunities for education than a book or oral history. Not only has most of the equipment on the submarine been functioning at least once, but it simply provides a rewarding experience

for the machinists who work on the submarine and tackle the puzzles of where parts went or how things worked—puzzles that can only be solved with donated tooling like the Wohlhaupter boring tools. Richard Pekelney, volunteer machinist and member of the Board of Trustees shared, “We could not restore Pampanito without companies like Allied.”

To learn more about Pampanito and the museum, visit <https://maritime.org/uss-pampanito/>.



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 **AUTODESK**

NASA Selects Developer for Rocket to Retrieve First Samples From Mars

The award brings NASA a step closer to the first robotic round trip to bring samples safely to Earth through the Mars Sample Return Program.

NASA has awarded a contract to Lockheed Martin Space of Littleton, Colorado, to build the Mars Ascent Vehicle (MAV), a small, lightweight rocket to launch rock, sediment, and atmospheric samples from the surface of the Red Planet. The award brings NASA a step closer to the first robotic round trip to bring samples safely to Earth through the Mars Sample Return Program.

“This groundbreaking endeavor is destined to inspire the world when the first robotic round-trip mission retrieves a sample from another planet – a significant step that will ultimately help send the first astronauts to Mars,” NASA Administrator Bill Nelson said. “America’s investment in our Mars Sample Return program will fulfill a top priority planetary science goal and demonstrate our commitment to global partnerships, ensuring NASA remains a leader in exploration and discovery.”

Set to become the first rocket fired off another planet, the MAV is a crucial part of a campaign to retrieve samples collected by NASA’s Perseverance rover and deliver them to Earth for advanced study. NASA’s Sample Retrieval Lander, another important part of the campaign, would carry the MAV to Mars’ surface, landing near or in Jezero Crater to gather the samples cached by Perseverance. The samples would be returned to the lander, which would serve as the launch platform for the MAV. With the sample container secured, the MAV would then launch.

Once it reaches Mars orbit, the container would be captured by an ESA (European Space Agency) Earth Return Orbiter spacecraft outfitted with NASA’s Capture, Containment, and Return System payload. The spacecraft would bring the samples to Earth safely and securely in the early-to-mid 2030s.

“Committing to the Mars Ascent Vehicle represents an early and concrete step to hammer out the details of this ambitious project not just to land on Mars, but to take off from it,” said Thomas Zurbuchen, the associate administrator for science at NASA Headquarters in Washington. “We are nearing the end of the conceptual phase for this Mars Sample Return mission, and the pieces are coming together to bring home the first samples from another planet. Once on Earth, they can be studied by state-of-the-art tools too complex to transport into space.”

Returning a sample is complicated, and MAV faces some complex development challenges. It must be robust enough to withstand the harsh Mars environment and adaptable enough to work with multiple spacecraft. It also must be small enough to fit inside the Sample Retrieval Lander. The Sample Retrieval Lander is planned for launch no earlier than 2026 from NASA’s Kennedy Space Center in Florida.

Lockheed Martin Space will provide multiple MAV test units and a flight unit. Work under the contract includes designing, developing, testing, and evaluating the integrated MAV system, and designing and developing of the rocket’s ground support equipment.

The cost-plus-fixed-fee Mars Ascent Vehicle Integrated System (MAVIS) contract has a potential value of \$194 million. The performance period begins no later than Feb. 25 and will extend six years.

NASA’s Mars Sample Return Campaign promises to revolutionize our understanding of Mars by bringing scientifically selected samples for study using the most sophisticated instruments around the world. The campaign would fulfill a solar system exploration goal, a high priority since the 1970s and in the last two National Academy of Sciences Planetary Decadal Surveys.

This strategic NASA and ESA partnership would be the first mission to return samples from another planet and the first launch from the surface of another planet. The samples collected by Perseverance during its exploration of an ancient river delta are thought to present the best opportunity to reveal the early evolution of Mars, including the potential for life.

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Industry News



Jergens Inc. Appoints Joseph Farkas as National Sales Manager for Workholding Solutions Group

Jergens brings on Joseph Farkas as national sales manager for its workholding solutions group as Ken Marvar looks to retire in April. Mr. Farkas comes to Jergens with more than 20 years of experience in sales development and management, as well as market channel strategies, for companies including The Timken Company, Fuchs, Sandvik and Kennametal.

“Joe has proven himself in his career with impressive results for some of industry’s top suppliers and I am confident that he will also do a great job and take WSG to the next level”, says Ken Marvar. Mr. Farkas timing coincides with key developments at the company. “Jergens workholding group has momentum in the market with recent advancements in top tooling and custom solutions focused on 5 axis machining productivity, and we have a lot of confidence that Joe can support those technologies at the customer level and throughout our strategic partnerships”, commented Matt Schron, Jergens Inc general manager.

“I am grateful for the opportunity and looking forward to both the challenges and accomplishments to come”, says Mr. Farkas. A proponent of strong business practices, Joe is Six Sigma trained and has a strong background in

business planning, P&L performance, sales and customer service metrics, and technical training. Mr. Farkas’ holds an associate degree in mechanical engineering from Stark State College, has a bachelor’s in business management from Malone University, and an MBA from Ashland University. He lives in the Akron OH area with his wife Mandy and daughter Savannah.

Verisurf Software, Inc. Names Nick Merrell as Executive Vice President

Verisurf Software, Inc. announces Nick Merrell to serve as executive vice president, effective immediately. Nick will continue to lead the technical support team, as he has since joining Verisurf in 2015, with added responsibilities that include driving corporate vision and managing continuous improvement of Verisurf processes, products, and people.



“As our technical operations manager for the past six years, Nick has demonstrated extraordinary leadership, management, organization, and communication skills. He is technically savvy and knows our software, the manufacturing markets we serve, and industrial processes and requirements extremely well,” said Ernie Husted, president, and CEO, of Verisurf Soft-

ware, Inc.

Verisurf Software continues the advancement of its measurement solutions and services based heavily on direct interaction and feedback from its users. This approach has served Verisurf well for more than 25 years and continues to influence strategy and key management decisions today. “Nick has championed this ‘customer first’ commitment repeatedly, effectively working with all columns of Verisurf’s operations and departments. We look forward to his continuing contributions to the organization and our customers,” added Husted.

ARCH® Cutting Tools Corp. Acquires North American Carbide

ARCH® Cutting Tools Corp., an ARCH Global Precision Company (ARCH), announced the acquisition of North American Carbide (NAC), of Orchard Park, New York. North American Carbide brings a strong reputation, developed over more than 40 years, of providing highly engineered cutting solutions.

“I am extremely proud to have the North American Carbide team join the ARCH family,” said Jeff Cederstrom, division president – ARCH Cutting Tools. “ARCH Cutting Tools has enjoyed a strong working relationship with North American Carbide for many years. Passion for solving customers’ most challenging cutting tool applications, dedication to quality and an unyielding entrepreneurial spirit make this a strong cultural fit within the ARCH platform. North American Carbide’s custom insert capabilities adds a strategic dimension to the ARCH offering and takes ARCH’s engineered cutting tool solutions to a new level for our customers.”

Bob Gralke, CEO of North American Carbide, said, “What an exciting

Industry News

time for the customers and employees of North American Carbide. We are all so fortunate to be partnering with ARCH Cutting Tools”.

ARCH president and chief executive officer Eli Crotzer notes the special significance of this acquisition for both organizations.

“As the ARCH team celebrates our 10th anniversary since the formation of the company on December 21, 2011, it is appropriate that our 34th acquisition involves such a transformational business as North American Carbide. The highly engineered specialty inserts that NAC excels at are highly complementary to our operations in both Flushing, Michigan and Mentor, Ohio”.

Renishaw Expands CMM Software Offering with Verisurf Agreement

Renishaw has entered into an agreement with Verisurf Software Inc., allowing companies in North America to access Verisurf coordinate measuring machine (CMM) software from Renishaw. With an emphasis on the Verisurf CMM Programming and Inspection Suite, this agreement enables companies to benefit from Renishaw’s advanced inspection technologies, including the REVO 5-axis measuring system and the Equator flexible gauging system, and the support networks of both organizations.

“We have been converting Renishaw Equator gauging systems into CMM Master shop floor CMMs and supporting the PH10 and SP25 solutions for years, so adding value to the PH20 and REVO 5-axis systems was a natural progression. We recognize the continuing advancement of this technology and plan to support other REVO sensors,” said Ernie Husted, president and CEO of Verisurf Software, Inc.

“At Renishaw, we appreciate the

continued support of our product line by Verisurf. Fast and easy CMM programming along with the value-added 5-axis Spiral, Edge and Pocket scan

types add to our customer promise of 5-axis efficiency and overall performance,” said Denis Zayia, president of Renishaw.



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Industry News

Jim Selway of Northern California's CNC Solutions Passes

Jim Selway began working for his father at Selway Machine Tool just out of high school and was the first of the Selway boys to work at Selway Machine Tool. Jim has been in the machine tool industry for over 50 years.



For the past 20 years Jim Selway has been the President at CNC Solutions. Jim was once asked if he was ever going to retire and he said "why

would I do that, all my friends are my customers."

All in the machine tool industry will miss Jimmy's infectious laugh and boyish smile. His dedication and work ethic are in a league of their own. Jim was also heavily involved in St Athanasius Catholic Church, SF NTMA, Thomas More School, Alum Rock Little League. "It will take more than one man to replace what Jim did on a daily basis both at work and volunteering."

CNC Solutions will continue to be a top northern California distributor with the help of Matt Selway (son), Paul Riley and Chris Riley. Jim leaves behind wife Agnes, his 9 children, 47 grandchildren, 3 great grandkids. So, yes there will continue to be Selway's in the machine tool industry.

Sandvik Acquires CNC Software Inc.

Sandvik has completed the acquisition of CNC Software Inc., a provider of CAD/CAM software solutions for manufacturing industries and the company behind Mastercam.

By acquiring CNC Software, Sandvik gains a CAM brand in the Mastercam software suite with an installed base of approximately 270,000 licenses/users, as well as a strong market reseller network and well-established partnerships with leading machine makers and tooling companies."This is in line with our strategic focus to grow in the digital manufacturing space, with special attention on industrial software close to component manufacturing. An acquisition of CNC Software and the Mastercam portfolio, in combination with our existing offerings and extensive manufacturing capabilities, will make Sandvik a leader in the overall CAM market measured in installed base, said Stefan Widing, president and CEO of Sandvik.

CNC Software has a strong market position in CAM, particularly for small- and medium-sized manufacturing enterprises (SMEs), something that will support Sandvik's strategic goal to develop solutions to automate the manufacturing value chain for SMEs and deliver competitive point solutions for large OEMs.

CNC Software is an independent, family-owned company founded in 1983, headquartered in Tolland, CT, with 220 employees.

"We at CNC Software are extremely excited to be joining the Sandvik family. The two companies share many of the same values and objectives, but above all, we share a passion for manufacturing. Together we will harness our joint resources to accelerate the development of Mastercam, while continuing to maintain our unique standards of local support through our

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experienced global Reseller channel, said Meghan West, CEO, CNC Software, Inc.

CNC Indexing & Feeding Technologies Named Exclusive US Importer

AR Filtrazioni Air/Oil Filtration Systems CNC Indexing & Feeding Technologies has been named exclusive U.S. importer for AR Filtrazioni industrial air/oil filtration systems.

AR Filtrazioni manufactures systems that use up to seven stages of filtration to remove contaminants including oil mists, fumes and dust from the air. The units improve air quality not only in manufacturing environments,

but also for front offices, positively affecting the health of every employee. In addition to purifying indoor air, the units also filter out contaminants that can flow out of the shop, into the atmosphere, and eventually back into soil and water.

Filtrazioni systems also are easy to maintain. Only three to five minutes are required to clean and replace all filters in a typical AR Filtrazioni air filtration system, making it an excellent choice for high-volume production environments. Further, these systems can integrate with most CNC machine tool brands, such as Citizen, Doosan, FANUC Robodrill, Makino, Mazak, Mori Seiki, Mitsui Seiki, Okuma, and many others.

“With more than 25,000 examples installed worldwide, Filtrazioni units are guaranteed to perform as expected,” said CNC Indexing & Feeding Technologies president Eric Bergman.

Open X Announces New Verisurf Metrology Training Course

Open X Education, an interactive learning platform, in collaboration with Verisurf Software, Inc., announces the latest metrology learning program designed for those seeking a career in the fast-growing manufacturing and metrology industry and professionals looking to expand their skills. The



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course focuses on CMM programming for inspection, and quality reporting of manufactured parts and assemblies, including programming of Renishaw 5-axis probing systems. Upon completion, students receive a CMM programming and inspection certification.

Open X is a modern online learning platform ideal for working professionals requiring flexibility. The CMM Programming and Inspection course is the newest metrology course following the popular, Fundamentals of Reverse Engineering and Verisurf Quick Surface courses. As a practical contributor to the Open X metrology curriculum, Verisurf provides examples of real-world workflows, best practices, and contributions from individuals with many years of experience in the field.

“We developed the Open X learn-

ing platform specifically for working professionals and students looking to advance their current career or get started in a new career. We have found that collaborating with experts, such as Verisurf, gives our curriculum a practical advantage over theory-based learning,” said Cody James, CEO of Open X.

Verisurf Software is built on a CAD platform and used throughout the CMM Programming and Inspection course. Verisurf has long been a leader in developing and supporting metrology software solutions rooted in Model-Based Definition (MBD). At the heart of MBD is the CAD model, it is the absolute authority to define a part or entire product providing a defined 3D data set, including all necessary GD&T annotations for inspection,

measurement, analysis, tool building, and reverse engineering.

Verisurf training, using the Open X online platform, is available 24/7 to any organization or individual seeking to learn dimensional metrology skills. Courses can be accessed using a desktop computer, laptop, tablet, or smartphone.

Mastercam Announces 2021 Wildest Parts Competition Winners

Mastercam has announced the 2021 Wildest Parts Competition winners.

The Wildest Parts Competition is held each year to encourage student interest and participation in manufacturing. The competition is open to

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Industry News

students at the secondary and postsecondary levels to create parts demonstrating creativity and technical skill using Mastercam. The Wildest Parts Competition also has a division for professional Mastercam users to enter parts they created.

In the Secondary Division, Wes Bruski from Capital High School, MT, submitted a domino and dice cup game set. He made the prototypes out of wood, then machined the final set. Second place went to Cadogan Wheat from Hamilton High School, MT, who designed a model of a padlock.

In the Postsecondary Division, Gus Bronk from Washington State University submitted a keyboard. The main case is machined from a

Boeing Surplus Forged billet of 2000 series aluminum from the 1970s. Jim Courtney from Erie Community College, NY, placed 2nd with a working carousel, and Jonathan Hughes from Erie Community College came in 3rd with a marble machine.

In the Teams Division, Wrin-dy Hauser's team from Grand Rapids Community College, MI, submitted Thor's hammer. The team members belong to a machinist apprenticeship program at the college. Jiao-Hao Wun's teammates from Vanung University, Taiwan, placed 2nd with their modern museum.

Ming-Yang Chen's team from Vanung University placed 3rd with a robot.

In the Professional Division, Andy Beach from Grand Rapids Community College submitted Ironman, which was created to test out a brand new UMC 500 Haas Mill where Beach works. The machine was the first 5-axis machine installed at Grand Rapids Community College. David Berry, from Southwestern Illinois College, placed 2nd with a dodecahedron of Mastercam toolpaths, and PUTEN PLUS came in 3rd with a wireless charging disc.

Every participant received a Mastercam t-shirt, and the winning entrants receive cash awards, certificates and other prizes for entering the competition.

Boom Aerospace Relies on Verisurf Software



"When you are designing and building a supersonic commercial aircraft, precision and quality verification of every part is critical."

Todd Wyatt
Metrologist, Boom Aerospace

"Verisurf software works with all our measuring devices and CAD files, and those used by our supply chain. Using Verisurf as a common measurement platform has improved quality and efficiency in inspection, reverse engineering, tool building and assembly guidance at Boom."



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Industry News

GMTA Names Vice President of Sales

Walter Friedrich, president and CEO of German Machine Tools of America (GMTA), has named Marius Braun to the post of vice president of sales for the company.

At GMTA, Braun will oversee the sales of the gear making machine lines sold by the company, most notably PROFILATOR, originators of the patented Scudding technology for gear generating. In addition, he will supervise the efforts on BvL parts washers, the STIEFELMAYER laser cutting machines for motor laminations, the SAMAG Multi Spindle machining centers, the ARNOLD laser welding machines and the entire line of RASOMA vertical lathe and special

purpose machine.

Braun has worked in the USA since 2017. He was previously a regional sales manager for Hermle and a Tier One key account manager for Magna.

GF Machining Solutions Announces New President of North America

GF Machining Solutions has appointed Chris Jones as the company's president and managing director of North America.

To advance the company's 2025 growth strategy, Jones will expand its presence in vital market segments, including medical, aerospace, automotive/die mold, packaging, energy and consumer electronics. Within these

markets, GF Machining Solutions will continue to provide manufacturers with innovative application-specific technologies.

"My intent is to champion the customer and ensure that GF Machining Solutions is their most reliable and trusted manufacturing partner," said Jones. "Leveraging my team's expertise and deep understanding of the challenges today's manufacturers face, we will work diligently to provide them with



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Industry News

the quality and service they need for success.”

Jones brings to his new position over 25 years of manufacturing industry experience and a history of driving results in both the industrial automation and machine tool sectors. His professional skills include Computer Numerical Control (CNC), complex robotic systems, sales management and Six Sigma.

HS&S Appoints McCarthy to Head new Southern California Office

HS&S Machine Tool and Metrology is expanding its sales and service operations into Southern California. John Servin is president of HS&S, a Santa Clara based company has been serving Northern California and Nevada for over 40 years. Dave McCarthy will be heading up with the Southern California operations. Dave comes to HS&S with a wealth of experience, over 30 years in the machine tool industry.



Dave is well-known and respected throughout the industry from his years of experience in machining processes, machine tools and metrology.

The HS&S product lines include Micro Vu vision-based inspection systems, Fine Part micro waterjet machines and more. HS&S owns their own line of machine tools which includes CNC milling, CNC turning, toolroom lathes and much more. Find out all their products at www.hsands.com

Stellar Industrial Acquires Nevada's JLM Industrial Supply

Stellar Industrial Supply, which distributes more than 35,000 MRO products and tools from more than 1,500 brands for safety, metalworking,

marine supply, aerospace, and other general manufacturing and processing organizations, and also offers customized indirect material management, announced Jan. 13 the acquisition of Sparks, NV-based industrial distribution and integrated supply firm JLM Industrial Supply. The acquisition gives Stellar Industrial Supply an im-

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mediate and strong market presence in the North Nevada Area.

The acquisition is scheduled to close March 31, 2022. Terms were not disclosed.

“We are ecstatic to build upon the reputation and platform JLM has established in the Sparks area, while extending the Stellar Industrial Supply brand into this marketplace,” Stellar Industrial Supply President and CEO John S. Wiborg said. “We will offer a deeper and broader array of supplies and services for MRO, Safety Supply, Metalworking, Abrasives and supply chain solutions, with a deep commitment to delivering the exemplary customer service, care, and experience that both companies are known for,” continued Wiborg.

Todd Drane of Fagor Corp. Passes

Todd Louis Drane of McKinney, Texas passed away January 23, 2022 at the age of 57. He was born on November 26, 1964 to Donald Thomas Drane and Shirley Ann (Blair) Drane in Bloomington, Illinois, where he graduated from Normal Community High School, and received his Computer Electronics Diploma from The American College of Technology. In 1995, he moved to Newport Beach, California where he met his future wife, Alisa Paige Artrip. They would later get married in 2001 in Maui, Hawaii. Todd worked for Fagor Automation for most of his career, which included him being western region manager and later marketing manager.

He was a Dragster Corvette enthusi-

ast and race car driver who won countless races and trophies over the years. Todd’s family will remember his love for nature and animals also. He was a loving husband, an amazing father, great friend, and truly a kind, gentle giant. Todd will be missed dearly by those who knew and loved him.



He is survived by his beloved wife, Alisa Artrip-Drane; son, Kyle Artrip and a host of other loving family and friends



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Industry News

Industry Leaders in Aerospace and Defense Composites Manufacturing Honored

SME, in association with its Composites Manufacturing Tech Group, recognized two individuals and two prominent composites manufacturing organizations at its 2021 Excellence in Composites Manufacturing Awards.

The awards, which are international in scope, honor contributions of those who have excelled in manufacturing products from advanced composite materials.

The J.H. “Jud” Hall Composites Manufacturing Award recognizes an individual’s innovation in solving issues related to production and applications development. It acknowledges

significant contributions that reduce costs and waste streams and improves quality and efficiency.

SME is recognizing J.H. “Jud” Hall recipients from both 2020 and 2021, due to pandemic restrictions that hampered business travel.

Kurtis Willden, Technical Fellow, The Boeing Co., is the recipient of the 2020 J.H. “Jud” Hall Composites Manufacturing Award. He is recognized for his successes in the development and implementation of processes and equipment for large-composite aerospace structures. Willden, a highly skilled engineer and innovator whose ideas are used in production, saved tens of millions of dollars annually and millions of dollars in nonrecurring cost avoidance in the last 10 years at

Boeing.

R&D Staff Scientist, U.S. Department of Energy’s Oak Ridge National Laboratory, is the recipient for the 2021 J.H.

“Jud” Hall Composites Manufacturing Award. He is leading ORNL’s development efforts for advanced manufacturing of molds and dies for the composite manufacturing industry.

Plataine, Ltd., received the 2021 Excellence in Composites Manufacturing Award (Small Company) for its instrumental achievements during the COVID-19 pandemic in helping its customers run their operations smoothly with smaller, less experienced workforces, maximizing utilization of existing resources and materials to increase product yield.



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New Products



to bolster support of their aerospace and energy customers. The application-based design of the LX021 maximizes part rigidity with its spindle and sub-spindle part clamping. The turret on the sub-spindle allows multiple work holding strategies to be used to fully machine blades in one set-up.

The LX021 offers a comprehensive integrated solution that includes a self-centering vice which minimizes part distortion while maintaining accuracy and repeatability and Kinematic correction cycles to calibrate the machine and verify its health over time along with advanced RCS CAM software designed specifically to generate optimize CNC tool paths. RCS blade inspection precisely measures blades, and compensates for forging variations to increase first time yield. A 10-pallet storage system with a spindle loaded part gripper to automate part set-up for continuous operation

Starrag's full solution strategy in-

cludes incorporating Blum-Novotest Inc probing technology for precise in-process part measuring, tool setting, and surface roughness verification. The surface roughness gage is programmed with 5-axis motion directly in the RCS CAM software. Roughness measurements can be made on surfaces as low as 16µin Ra. After in processes measuring, the data is saved ready for SPC quality monitoring.

Starrag is also partnering with HAIMER, a leading precision tool holding manufacturer, to include their heat shrink holders and power clamp special addition heat shrink unit in the lab. Haimer's high-precision holders,

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New Products

feature max runout of 3µm at 3XD, 360° clamping contact, are precision balanced to G25@25000 RPM and offer simple and repeatable tool assembly.

The Power Clamp Special Addition heat shrink unit features a compact easy to use portable design that is perfectly equipped for handling smaller diameter tools.

Enhanced Functionalities for Easy Viewing of 3D CAD Data —HCL Technologies

HCL Technologies has released HCL Glovius 6.0 with enhanced functionalities for easy consumption and viewing of product design data.

Glovius is a multi-platform visualization solution that enables access to 3D computer aided design (CAD) data on Windows, Cloud, iOS and Android apps.

Glovius supports all popular CAD formats, including CATIA, NX, Creo and Pro/ENGINEER, SOLIDWORKS, SolidEdge, Autodesk Inventor, STEP, IGES and JT. Glovius enables users to measure, section, analyze, compare and export 3D CAD data to STEP, IGES and other formats. The new rendering engine in

The latest release improves picking and rendering of measurements, allowing users to measure STL, CGR and other graphics file formats.

Additionally, Glovius 6.0 features an improved export option with

WYSIWYG enhancements, allowing users to export files as image snapshots, PowerPoint, 3DHTML, 3DPDF and Bill of Materials (BoM) for easy

sharing and collaboration. Users can also now protect IP and product design data by selectively exporting components in an assembly.



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New Products

CNC Offset Manager Software-Mitsubishi Electric

Mitsubishi Electric offers its CNC Offset Manager software for remote modification of computerized numerical control (CNC) tool and work offsets.

“With the push towards automation and central control, machining facilities are searching for more efficient ways to manage their CNC machines,” said a company spokesperson. “This software can introduce increased efficiency in multiple ways: for instance, it allows one operator to manage more machines, speeds up machine set-up and tool wear changes, or adjusts for parts out of tolerance. It also centralizes this work so operators do not need to move between machines or into ro-

bot cells. CNC Offset Manager is thus geared towards production managers and supervisors on factory floors across various industries, as well as towards CNC automation software companies.”

CNC Offset Manager runs on Windows and is networked to the Mitsubishi Electric CNC via Ethernet. It also has a feature that allows other automation software or systems to interface with the CNC to fully automate the offset management process, or make the changes from a central cell-management software. This allows software companies to interface their software with Mitsubishi Electric CNC for automation and remote offset management and allows manufacturers with CNC equipment to automate their machine-tending CNC cells and testing

or measuring equipment, or centralize the offset management operation so operators and floor workers can work more efficiently.

Productivity Features for Portable Measurement, Analysis and Reporting-Hexagon

Hexagon’s Manufacturing Intelligence division offers the latest version of Inspire inspection software designed to take on a wide range of metrology applications with the ease-of-use of a handheld tablet or iPad.

The software’s navigation gives ready access to the functionality that intuitively makes sense for the mea-

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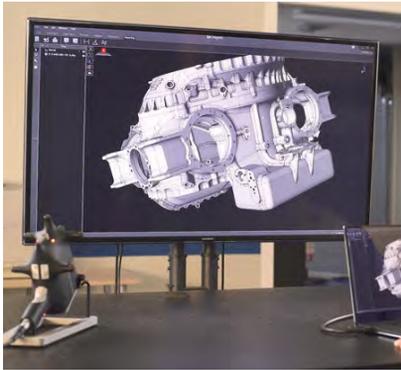
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New Products



surement or inspection task at hand. The latest version of Inspire introduces a variety of advancements, including additional GD&T improvements, enhanced point cloud meshing for scanned data and new feature extraction capabilities.

Inspire software integrates with Hexagon’s flagship portable scanning and probing devices, including the high-speed Absolute Scanner AS1, Absolute laser trackers and portable measuring arms, and other metrology devices.

Software highlights include a new delete noise function to rapidly delete outlier data in point clouds; the addition of measurement triggers; and more data import and export options. The software also introduces the ability to create cross-sections of a point cloud without the need for a CAD model.

Inspire’s learning curve is decidedly short for new and existing users with novice to expert skill levels. Hexagon offers a broad range of training materials from online videos and tutorials

culminating in nearly four hours of user training resources.

“Inspire is designed to make the complex simple with an eye on the expectations of a new generation of users breaking into the field. The latest version of Inspire takes the user experience (UX) to the next level with new navigation and feature enhancements,” said Dave O’Neal, Inspire Product Manager at Hexagon.

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New Products



High Productivity and Automation Flexibility —Okuma

Okuma America Corporation, the U.S.-based sales and service affiliate of Okuma Corporation, has announced the MA-600HIII, a rigid and accurate horizontal machining center (HMC)

equipped with a powerful spindle.

The MA-600HIII's new 10k RPM standard spindle effectively handles a wide range of applications. The improved spindle tool change time is just 0.4 seconds coupled with the now-standard through-spindle coolant suction feature, which removes residual coolant inside the tool and spindle.

This HMC has a larger work envelope with added longer X-axis travel. "Weighing in at a massive 55,000 lbs. and featuring a thermal stability of seven microns, this machine has the stability and rigidity needed for consistent precision machining," said a company spokesperson.

The MA-600HIII features an enhanced coolant management system, more efficient workspace design to

prevent chip accumulation and improved chip evacuation functionality. This includes linear ball screw cooling for the X-, Y- and Z-axes.

The MA-600HIII's flexible design allows for a variety of automation applications. The workspace area can equip up to seven part loading/unloading ports or up to eight workholding clamp ports, which can help eliminate the need for complicated circuit arrangements for hydraulic applications. Up to 16 ports are available in the machine's setup station, expanding part capacity and the possibilities for robotic applications.

The standard sludgeless tank suppresses the accumulation of coolant sludge for stable operation of the machine.

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New Products

Vertical CNC Lathes Handle up to 99 Tons on Chuck

—Romi

Romi's VT series vertical CNC lathes includes six models ranging from the VT 1400M with a load capacity of 22,000 lbs. to the massive VT 6000 that will handle 198,400 lbs. on chuck.

The ability to effectively machine parts this size is made possible in large part to Romi's cast iron monoblock beds, columns and vertical carriage. "The robust mechanical structure provides exceptional rigidity, stability and versatility for machining workpieces found in heavy industry," said a com-

pany spokesperson.

The series includes the VT 1400M, VT 2000M, VT 2500M, VT 3000M, VT 5000 and VT 6000 with table sizes from 55" to 236" with maximum turning diameter from 63" up to 276" and maximum height allowed from 65" to 157".

All models feature vertical RAM, C-axis, 31 kW live tooling with spindle taper ISO 50 with either a 10 or 20 tool magazine, and linear scales for machining precision. The VT Series are equipped with a Siemens Sinumerik 840D SL CNC with a large 19" LCD color monitor, USB port and Ethernet interface.

New Series of Micro End-mill for Increasing Medical Device Manufacturing Productivity

—GenSwiss

GenSwiss, a leading source for tools, accessories and processing assistance for small parts and Swiss machining, has introduced a line of micro endmills specifically aimed at the production of torx/hexalobe drive features.

The new 1430 and 1450 series end-mills feature clearance for deep pocket milling commonly required for producing drive sockets in medical grade alloys used to produce implantable parts.



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Available in cutting diameters from .2mm up to 1mm, and including 3 and 4 flute configurations, these new end mills provide exceptional surface finish that meets the demanding criteria of the medical manufacturing industry or in any industry where precision and aesthetics are paramount such as fasteners for collector knives, up-market fishing reels or automotive decorative parts.

They can be used to produce standard T-sockets from T6 and up. A variety of high-performance coatings can be applied to increase performance in many types of machinable materials.

TOP-Cut VAR High Performance End Mills Line Expanded —Emuge-Franken

Emuge-Franken USA has significantly expanded the range of TOP-Cut VAR, its most popular multi-purpose high performance end mills.

The TOP-Cut VAR line is now available in 4,5, and 6-flute configurations, with or without corner radius, and ball nose, stub, standard and long lengths in inch sizes, over 300 SKU's in total. In addition, Emuge-Franken USA can provide custom variations or tool modifications of TOP-Cut VAR mills.



TOP-Cut VAR end mills feature unique flute and profile geometries optimized for long tool life and superior performance in both roughing and finishing applications. Variable

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helix angle flutes provide extensive vibration dampening and are precision ground with advanced edge preparation to maximize chip evacuation. A chamfer feature protects cutting edges to prevent chipping, and end mills with fully blended corner radiuses extend tool life, while providing improved surface finishes.

Emuge -Franken reports that all TOP-Cut VAR end mills have an advanced ALCR PVD coating that enables outstanding performance and extended life in higher operating temperatures, and a proprietary sub-micro grain carbide provides maximum abrasion resistance and durability.

New TS 760 Probe with CNC Controls for 5-axis Machining —HEIDENHAIN

HEIDENHAIN introduces the new TS 760 touch probe for use with its contouring TNC and other major CNC controls. This device is distinguished by 3-D accuracy making it especially useful during 5-axis machining and more.

The new TS 760 probe offers extremely high accuracy ($\pm 1 \mu\text{m}$) and homogeneous switching behavior over 360° . And for 3-D measurement, the feed rate/probing speed of 1 m/min is four times faster than other commercially available products that offer

the same impressive repeatability of ($2\sigma \leq 0.25 \mu\text{m}$).

The TS 760 also offers an ultra-low trigger force of ($\approx 0.2 \text{ N}$; axial: $\approx 1.5 \text{ N}$) eliminating form and surface damage. And if desired, the probing point can be cleaned with the integrated flusher feature by using compressed air and cooling lubricant of up to 60 bars.

The new probe system uses a superior EnDat communication signal, along with the SE 661 that offers a



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radio or infrared channel selection conveniently setup on the TNC screen. And HEIDENHAIN offers local integration service to upgrade to the next level Touch Probe technology even on non-HEIDENHAIN CNCs.

Regarding its functions, the TS 760 is fully compatible with HEIDENHAIN's TS 740 predecessor and provides the same additional data as the TS 460.



Combination Vertical/Horizontal Milling Machine —Expand Machinery

Expand Machinery has introduced the Ganesh LC-205F, a combination vertical/horizontal milling machine for R&D, short runs and repair work.

The machine features integrated DROs for position display and a 12”

x 51” worktable. The 7.5 HP variable speed #40 taper spindle runs in 2-gear ranges from 60 RPM to 4,500 RPM to provide heavy-duty cutting capability. An LED digital spindle speed display is provided for easy viewing. Servo motors drive the ballscrews for X and Y positioning. Power knee and power

quill drive are included. Hardened and ground ways in the Y and Z axes provide wear resistance to help ensure a long and productive service life.

“Users find that the flexibility of being able to fixture the workpiece from either the vertical or horizontal spindle can provide greater cutting rigidity, which results in greater productivity. This approach is beneficial both for short run and for stock preparation, or roughing or finishing a CNC production workpiece,” said a company spokesperson.

MK Series NC Rotary Tables —Kitagawa NorthTech

The new MK Series of NC rotary tables is Kitagawa NorthTech's latest family of compact and easy-to-use

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“The MK Series offers improved performance with higher resistance to machining forces via improved brake/clamping torque. Clamping torque for the MK Series is up to an impressive 1,000 Nm or 737 ft-lbs. of torque. With this enhanced capability, even the toughest applications are now within reach,” said a company spokesperson.

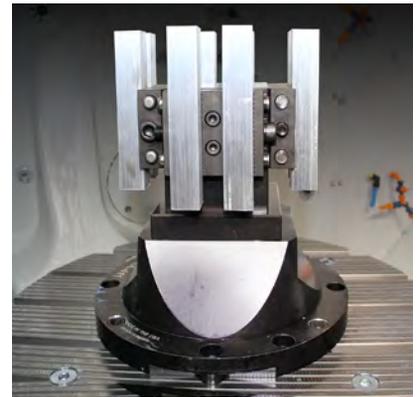
The MK Series features a com-

compact, ergonomic design that allows for improved and easier mounting. A wide selection of multi-channel rotary joints makes the MK Series versatile when choosing hydraulic or pneumatic workholding options.

The MK Series Rotary Tables are suited for automation environments where a secure hand-off from the robot to the workholding device can be confirmed via direct or indirect clamp confirmation.

New Pin Vise —5th Axis

5th Axis Inc. co-owner Steve Grangetto announced that the firm would manufacture and sell pin vise fixtures for 3, 4, and 5 axis CNC machines. Pin Vises are high-precision, quality



fixtures featuring a skeleton design that makes them lighter, more compact, and cost-effective.

Pin Vises have a small footprint, allowing room for more parts on a table resulting in increased throughput. Pin Vises are also lightweight making them ideal for automated applications where



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weight is a consideration.

“The Pin Vise design performs well. We have successfully used Pin Vises for in-house machining for years, and decided to make them available to the public,” explains co-owner Chris Taylor. “The compact design and the price point make the Pin Vises perfect for high-volume applications.”

Serrated teeth on each jaw provide maximum grip on stock less than 35HRc. Pin Vises also have built-in 45° dovetails for harder material and require less clamping force. Dovetail clamps wedge the stock down, ensuring a secure hold on much less stock than vise-mounted parts.

Available in 4” and 6” models, Pin Vises provide reliable clamping ranges

of 0.25 to 2.50 inches. Pin Vises are direct mount ready from the top-down utilizing standard socket head cap screws. Operators bolt the vise directly to mounting plates, adapters, or t-slots on the machine table. 5th Axis also offers tombstones, pyramids, and plates for the Pin Vise configured with 96mm RockLock quick-change systems.



Ascent™ Line of Pre-Engineered, Configurable Hydraulic Presses — Beckwood

Beckwood Press Company announced the launch of Ascent™, a line of standard, high-quality hydraulic

presses.

Ascent™ presses are pre-engineered for cost efficiency and have models ranging from 30 tons to 500 tons and 21 different frame sizes, the Ascent™ line offers an array of choices for manufacturers and jobs shops of every size.

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provides superior guidance and rigidity. Speed, stroke, daylight, and shut height are fully configurable to the customer's exact needs, while options for heated platens, HPU configurations, and safety equipment add to the line's flexibility.

As with all Beckwood presses, the Ascent™ line is built in the USA, engineered for Infinite Life using Finite Element Analysis, and backed by the company's service and support team.

New Turning System Has Eight Cutting Edges Per Insert

—Kennametal

Kennametal has released the Fix8 heavy-duty turning system, which the company says delivers maximum metal removal rates in steel, stainless steel and cast iron. With eight cutting edges per insert, the Fix8 turning system is said to increase productivity of heavy-duty turning operations while providing the lowest cost per edge and reducing cutting forces up to 15%.

"Fix8 is designed to cover a wide

range of applications, including turning and facing, smooth surfaces, interrupted and heavily interrupted cuts. From medium depth-of-cut to roughing in steels, cast iron and challenging materials like stainless steel, Fix8 handles it all. Even extreme feed rates of up to 0.055" and depths of cut up to 0.472" are possible with Fix8," says Matthew Fuerst, product manager, Kennametal.

The design of the Fix8 insert features a rigid clamping system that pulls the insert securely into the pocket seat, reportedly offering superior stability that enables the insert to withstand large cutting forces and vibrations. The

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insert is also supported by a replaceable carbide shim.

The Fix8 tool holder features precision 3D coolant technology, supplying sufficient coolant where needed. Three coolant nozzles are directed to the rake face, controlling temperature, chip evacuation and supporting chip formation. Coolant exit holes in two different locations are directed toward the flank of the insert.

Fix8 provides excellent chip control for any heavy-duty turning application while increasing tool life. The insert design reduces cutting forces and power consumption, which the company says makes it ideal for low horsepower lathes.



New Line of Multipurpose Thread Mills-Emuge —Franken USA

EMUGE-FRANKEN USA, announced the launch of a new line of

multipurpose thread mills designed for threading a wide range of standard materials efficiently and economically. Ideal for job shop manufacturing where part applications and materials frequently change, Emuge Multi-THREAD™ Thread Mills provide a versatile solution for many threadmaking requirements.

MultiTHREAD Thread Mills enable shops to boost their production output and save on threadmaking costs, as fewer types of thread mills need to be stocked in the tool crib and the possibility of broken taps and scrapped parts are eliminated. “MultiTHREAD cuts most materials that job shops encounter while providing thread accuracy, quality and finish with high



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process security and control,” said Marlon Blandon, Emuge-Franken USA thread milling product manager.

MultiTHREAD Thread Mills feature a proprietary TIN T21 coating developed by Emuge, which reduces chip welding and improves chip evacuation. MultiTHREAD Thread Mills also allow one tool to thread both through and blind holes and make right or left-hand threads. Two types of sub-micro grain carbide thread mills are offered – full form or single plane. Full form thread mills that machine threads in one time-saving cutting rotation, feature a rigid core diameter that reduces deflection. The single plane design enables one tool to produce multiple thread sizes and allows the pitch diameter to be controlled.

EMUGE MultiTHREAD Thread Mills are available in a broad range of types and sizes. Full form 2XD thread mills range from No.10 to 3/4” sizes in solid tools, and 1/4” to 1” sizes in coolant-through tools. Full form thread mills are also available in metric sizes. Single plane 2XD thread mills range from No. 0 to 3/4” including STI sizes in inch, and 3XD single plane mills range from No. 2 to 3/4”. Single plane models are available in either solid, or coolant-through on larger sizes. In total, over 80 SKUs of MultiTHREAD tools are stocked as standard.

EDM Tooling Adapters-Suburban Tools

Suburban Tool, Inc. has announced the addition of an EDM tooling accessory for its Master-Grind Spin Index Fixture. The new EDM tooling adapters are designed to mount System 3R, Erowa and Carl Herschmann EDM chucks to the Master-Grind for use in the manufacture of EDM tooling and the EDM manufacturing process.

“Purchased together, the customer will receive the Master-Grind with the EDM chuck of their choosing, completely assembled, indicated in and ready for use. It comes complete with a custom fitted wooden storage case,”

said a company spokesperson.

Suburban Tool manufactures products in its 70,000 sq. ft. world headquarters in Auburn Hills, MI.

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...Hotline Continued From Page 8

Parallel Systems Receives \$50 Million on Series A

Parallel Systems, an electric rail vehicle maker founded by three SpaceX veterans, picked up nearly \$50 million in Series A funding in January. The investment, led by Anthos Capital in Santa Monica with contributions from Congruent Ventures, Riot Ventures and Embark Ventures, will be used to build a fleet of rail vehicles, complete testing programs and grow the team, according to the Culver City-based company.

"What we're doing right now is we are fabricating our second-generation vehicles, and we're launching an advanced test program that's really going to answer a lot of key questions that will lead us down the path to commercialization," said Chief Executive Matt Soule, who was head of avionics at SpaceX before co-founding Parallel Systems with John Howard and Ben Stabler, former SpaceX coworkers. Howard now serves as the vice president of hardware for Parallel Systems, while Stabler is the vice president of software.

To implement the testing program, the founders are planning to scale their team from 25 to about 85 in the next 12 to 18 months and hire "a lot of software and hardware engineers," added Soule.

Parallel Systems' rail cars do not need a locomotive - they are autonomous and individually powered, featuring a battery-electric permanent magnet synchronous motor and a bi-directional camera-based perception system. They also have redundant braking that enables them to stop up to 10 times more quickly than a train, according to the company.

Kohler Brings 1M SF Factory, 425 Jobs to Casa Grande, AZ.

Kohler Co. plans to build a new 1 million-square-foot manufacturing facility on 200 acres in the industrial corridor of Casa Grande, city officials revealed.

Casa Grande City Council met Tuesday to approve the development agreement.

The Kohler deal is the latest economic win for Casa Grande. Earlier this year, Lucid Motors started production of its Lucid Air at its Advanced Manufacturing Plant in Casa Grande.

"Pinal County sits at the epicenter of two big cities and is the point of intersection where all infrastructure in the state comes through," says Jakob Andersen, president and CEO of Saint Holdings, the developer behind some of the county's largest land deals, in-

cluding two massive industrial parks.

Andersen notes that land prices in Pinal County are about 50% to 60% cheaper than in Metro Phoenix.

Kohler, a kitchen and bath equipment manufacturer, plans to build its new factory south of Maricopa-Casa Grande Highway. The site is across the road from the Frito-Lay plant in Casa Grande. It will take approximately 18 months to complete once construction begins.

The Kohler plant is the first major project that would be built at the Pinal County Technology Park, a 1,000-acre parcel between Clayton Road and Maricopa-Casa Grande Highway.

Once completed, the site is expected to employ 425 within five years.

Boeing's Deal with Qatar Airways is Good News For Everett, Renton WA. Workers

At a White House signing ceremony, Qatar Airways placed a \$34 billion deal with Boeing. The highlight of that deal is for up to 50 Boeing 777X freighters, a big boost to the 777X program that still awaits FAA certification to fly, and airlines that aren't anxious for the giant plane as international air travel continues to recovery from severe impacts from COVID-19.

It'll be 2027 when deliveries of the freighters should begin. Deliveries of the first passenger jets are delayed until late 2023, though the company has built more than a dozen of them - most parked around Everett's Paine Field where they are built. The plane made its first test flight on Jan. 25, 2020.

The deal is valued at \$34 billion at list prices for up to 50 777-8 freighters, two current-model 777 freighters, and up to 50 of Boeing's largest Renton-built 737s, the 737 MAX 10. Qatar already has 777X passenger jets on order.

Of the 50 freighters, 34 are firm orders, with options for another 16. Of the 737 MAX 10s, 25 are firm and 25 are options.

Boeing says 20 of the airline's 60 777X orders were converted from passenger jets to freighters.

"The announcement is a huge boost to Boeing and Everett's economy," Everett Mayor Cassie Franklin said. "Obviously, the freight industry has only become more and more important in this pandemic. And to get that large of an order out of Everett, that's a perfect fit, we've got the workforce."

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5-Axis will result in decreased production time (mostly due to reduced set-up), which means shorter lead times.



INCREASE ACCURACY

Flipping parts to machine another side in a 3x process can result in inaccuracies. 5x eliminates by machining up to five sides in a single setup.



BETTER PART FEATURE ACCESS

5x allows shorter tools, so they are more rigid, reduce chatter and improve accuracy and finish. Can also maximize best angle for cutting tool.



INCREASE SHOP CAPABILITIES

If you have 5x you can increase what you can offer your customers – meaning more market share and getting jobs not possible without a 5x machine.



FIND OUT WHY HURCO LEADS THE INDUSTRY IN 5-AXIS TECHNOLOGIES.

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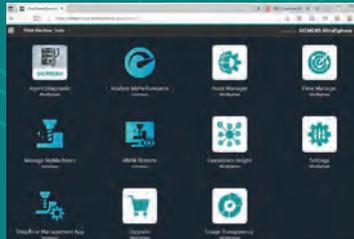


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