

CNC WEST

Volume 39 - Issue 6

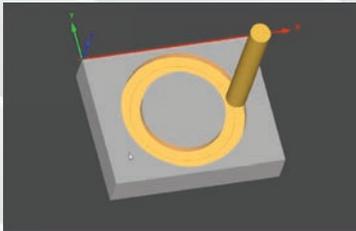
THE MAGAZINE FOR WESTERN METAL WORKING MANUFACTURING

WATERJET & GRINDING ISSUE

- **CORONADO MANUFACTURING IS REINVENTING THE COMPANY IN THE EYES OF THIR CUSTOMERS**
 - **MAKE ONE - MAKE IT NOW, AT J.E.M. F/X**
 - **LAND AND SEA ARE NO MATCH FOR MILLER MARINE**
- ...Plus Much Much More**

Now In Our 39th YEAR

GET MORE FROM YOUR CNC



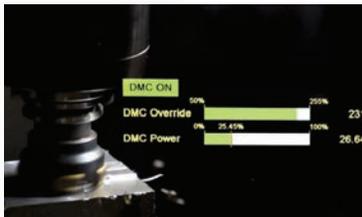
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Remote CNC Support



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Dynamic Machining Control (AI Machine Learning Option)



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- COOLANT THRU PREPPED
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FM5AX350



- 15K RPM AIR/OIL LUBRICATED SPINDLE
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- CHIP CONVEYOR
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for Small VMC's

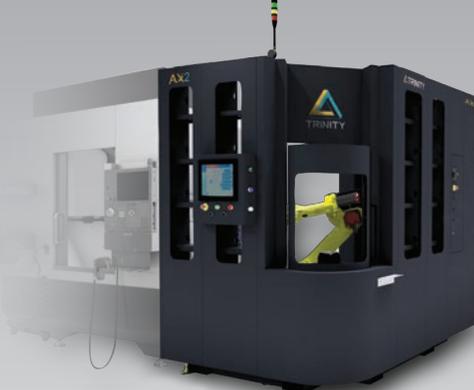
AX1



Pallet Storage Stations: 20 / 30
Max Part Size: 8"Dia x 8"H
Pallet + Work Holding = 18lbs
Size: 43"W x 88"D x 97"H

for Medium VMC's

AX2



Pallet Storage Stations: 16 / 24
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Pallet + Work Holding = 55 lbs
Size: 78"W x 107"D x 115"H

for Large VMC's

AX5



Pallet Storage Stations: 42
Max Part Size: 18"D x 12"H
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CNC West

August/September 2021 • Volume 39 No 6

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Coronado Machine challenges themselves to be better every day. Their new Studer is an example of this..... Page 22



Miller Marine's MAXIEM 1530 Waterjet is one of the largest machines in the area and is the most versatile CNC in the shop.Page 32



J.E.M. F/X's has a CNC milling and turning department along with a waterjet department not shown.....Page 36

Coming in Oct/Nov 2021
Cutting Tools & Workholding
 —Looing for innovative developments offering better, faster, more accurate cutting tools and material? This is the issue to search. This will also be our WESTEC preview issue. We will print extra copies and pass out from our booth at the show.

Editorial: Sept. 20, 2021
Ad Space: Sept. 26, 2021
Ad Material Oct. 2, 2021

CNC WEST

VOL. 39 NO. 6
August/Sept 2021

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

(714) 840-1300 FAX: 657-231-9307
Email: sarnold@cnc-west.com

Founder:

Thomas F. Arnold (1927 - 2009)

PRESIDENT/PUBLISHER:

Shawn Arnold

EDITOR: Sean Buur

CIRC. MNGR: Charlene Strawbridge

PROD. MNGR: Linda Arnold

PROD. ASST: Jennifer Hallman

ADVERTISING SALES:

(714) 840-1300

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Show Time Is Back, Are You Ready?

The day this magazine was turned in to the printer, I went to the Anaheim Convention Center to attend the Medical and Design Show at the Convention Center. I have no idea how attendance will be, what the safety protocols will be or if it will be worth my time to attend. I am expecting it will be. I am excited to visit some old friends, see some new technology and get a feel for peoples thoughts on where our industry is going.

In early September CNC WEST will have a booth at the Northwest Machine Tool Show in Portland. A few weeks after that in mid-September Fabtech will take place in Chicago. And finally in November, WESTEC the big show of the western region will take place in November. CNC WEST has a booth there also.

I still think shows are an excellent way to get new customers and show people your products and new technology. Some might call me a dinosaur but hey I still believe print is an excellent vehicle to be seen in this industry.

Our cover article in this issue was written by Sean Buur and is about a shop in southern California. They recently purchased a Studer CNC grinder and are extremely happy about it. Their mantra is to be flexible and to always try to fill the customers needs. Seems like they are succeeding. Another article in this issue written by Sean is on a San Diego company who does lots of work for the Navy. Makes sense that for Navy jobs they do a lot of work on their waterjet.

Another article deals with a company that makes props and sets for the movie and TV industry. As you can imagine most things are one off and needed quickly. Employees have a job title of I do a little of everything. I think you will enjoy this story. Our last feature article was submitted to us and is about a shop in California called WET Design that creates water features that are quite a few cuts above the fountains you might see at your local mall or city park.

I hope you enjoy this issue. Next issue is our October/November issue and it will be the start of 40 years of putting out CNC WEST. It will also be our WESTEC issue and will probably be our biggest issue of the year.

Thanks for reading ,

Sincerely,

Shawn Arnold

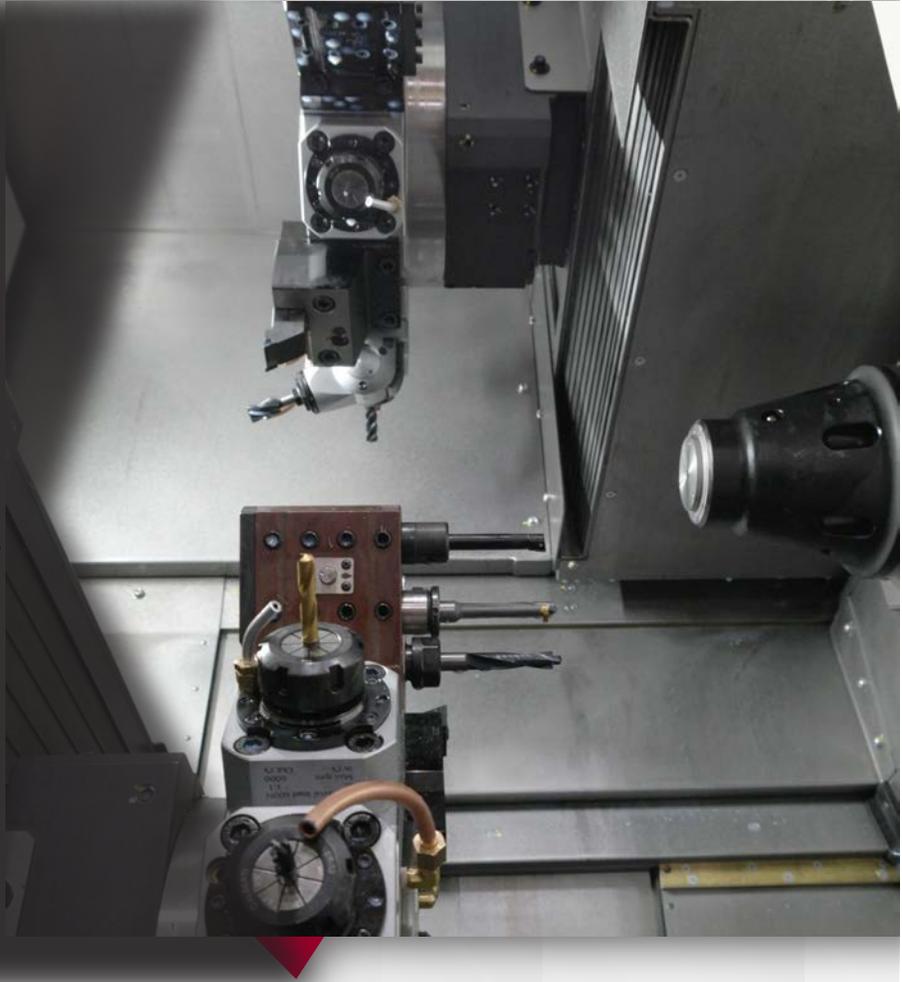
Shawn Arnold
Publisher



Nakamura-Tome

WY-150

Multi-Tasking Made Simple



The WY-150 is a twin spindle machine with two turrets, upper and lower, both with Y-axis. With this configuration, the opportunity exists to drastically reduce cycle times, by offering highly capable features like pinch milling, drilling and turning, as well as unique "off-center" interpolative functions that can be performed on both spindles.



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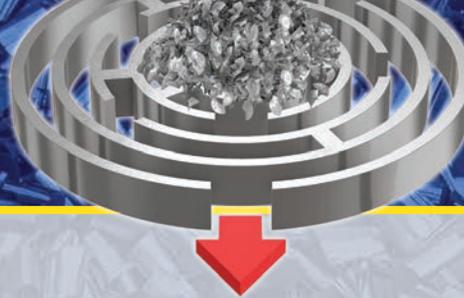
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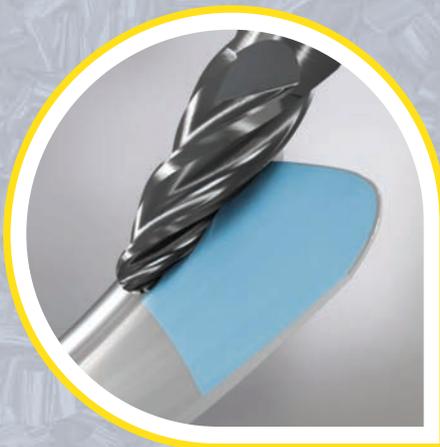


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New Barrel Shaped MULTI-MASTER Head for Accurate Finishing
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EXEC HOTLINE

Scappoose's Oregon PCC Manufacturing Center Lands \$100K

Portland Community College's Foundation has snared a sizable gift for an impending new manufacturing teaching hub.

The Oregon Community Foundation revealed in June it has given PCC's foundation a \$100,000 Leadership Grant to help launch the Oregon Manufacturing Innovation Center's Training Center. The 32,000-square-foot center, designed to train students for manufacturing and other STEM-related jobs, is set to open this fall in Scappoose.

The money will help purchase capital equipment and fund scholarships and student financial assistance.

Faraday Future Aims to Get California EV Factory Up and Running By Next Summer

Faraday Future Inc. has unveiled a hybrid manufacturing strategy that will see the electric vehicle maker build its flagship vehicle in California and future models overseas.

The Los Angeles company said in mid June that it will manufacture the luxury FF 91 in its refurbished 1.1 million-square-foot factory in Hanford, California. Faraday has hired design firm Ware Malcomb to finalize the facility's architectural planning, interior design and civil engineering. The company said that the site will be able to produce about 10,000 vehicle per year when it's up and running.

Faraday plans to go public via a reverse merger with Property Solutions Acquisition Corp. raising a billion dollars in the process. The company said that the FF 91 is expected to be ready to begin production within a year of the closing of the merger.

"FF has already completed significant investment at our Hanford manufacturing facility, and with the additional funding from our merger with PSAC, we anticipate that the plant will be up and running in the near future," said Faraday Global CEO Carsten Breitfeld in a statement.

United Adding Aircraft from Boom Supersonic

United Airlines announced a commercial agreement with Denver-based aerospace company Boom Supersonic to add aircraft to its global fleet as well as a cooperative sustainability initiative.

Under the terms of the agreement, United will purchase 15 of Boom's 'Overture' airliners, once Overture meets United's demanding safety, operating and sustainability requirements, with an option for an additional 35 aircraft. The companies will work together on meeting those requirements before delivery. Once operational, Overture is expected to be the first large commercial aircraft to be net-zero carbon from day one, optimized to run on 100% sustainable aviation fuel (SAF). It is slated to roll out in 2025, fly in 2026 and expected to carry passengers by 2029. United and Boom will also work together to accelerate production of greater supplies of SAF.

Capable of flying at speeds of Mach 1.7 - twice the speed of today's fastest airliners - Overture can connect more than 500 destinations in nearly half the time. Among the many future potential routes for United are Newark to London in just three and a half hours, Newark to Frankfurt in four hours and San Francisco to Tokyo in just six hours.

BAE Wins \$105M Navy Contract for USS San Diego Maintenance, Repair

The San Diego ship repair business of BAE Systems has secured a potential \$104.9 million contract from the U.S. Navy for maintenance, modernization and repair services in support of the USS San Diego, a San Antonio-class amphibious transport dock.

BAE will execute contract work at its San Diego, California facility through November 2022.

Continued on page 74...



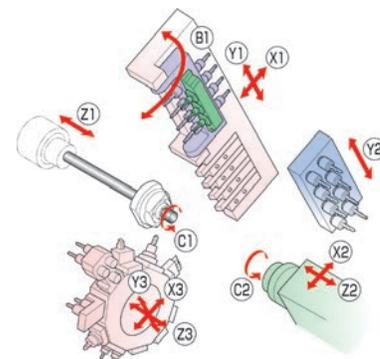
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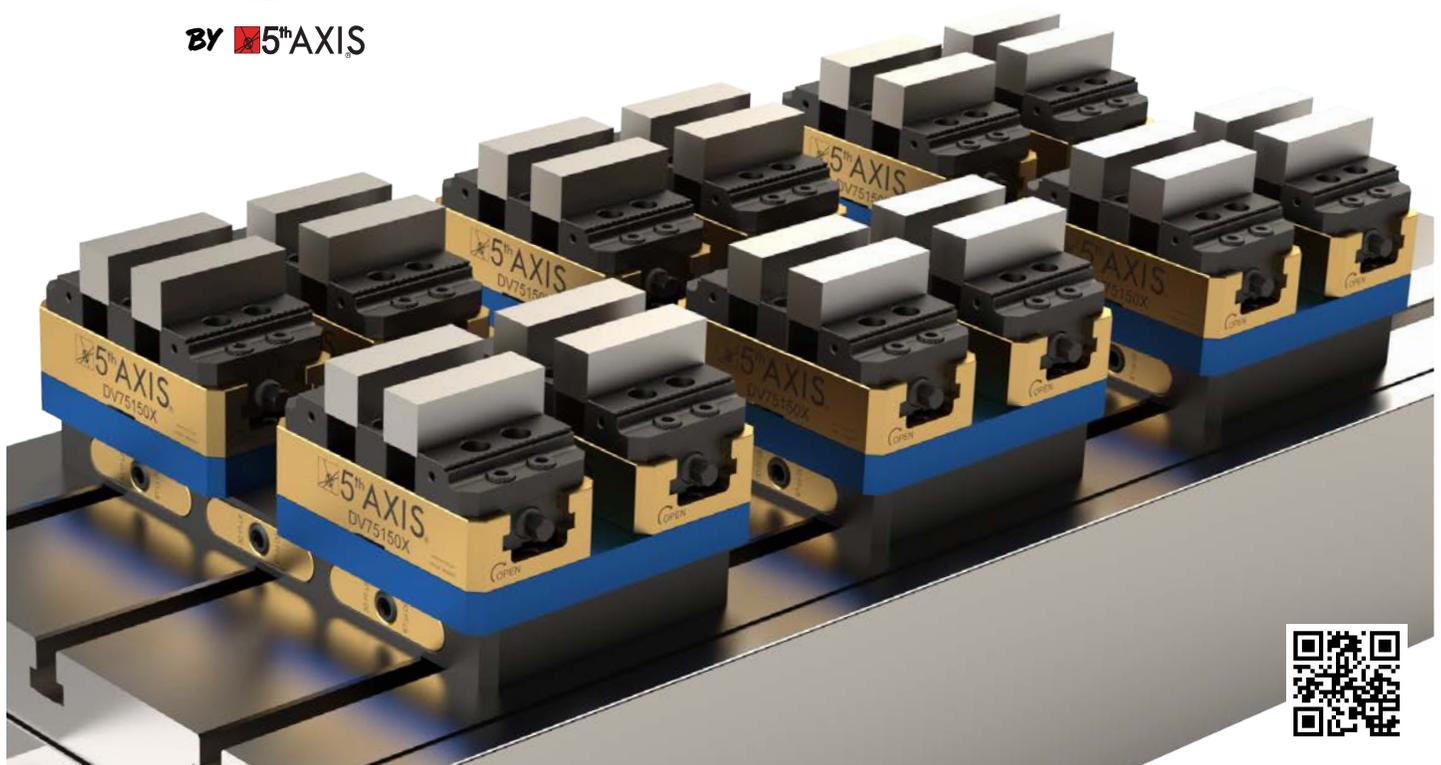
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USST ROUND JAWS

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- For CNC lathe chucks with 1.5mm x 60° serrations
- Also available in steel or cast iron
- Additional heights available
- Custom jaws made to order!
- **MADE IN USA!**



Chuck Size	Groove Width	Screw Size	Hole Space	Pie Dia	Height	ALUMINUM Part Number	Price SET OF 3
1.5mm x 60° Serrations							
6"	0.472	10mm	0.787	6"	2.00"	RKT-6200A	\$ 79.15
	0.472	10mm	0.787	6"	4.00"	RKT-6400A	\$ 129.58
8"	0.551	12mm	0.984	8"	2.00"	RKT-8200A	\$ 93.05
	0.551	12mm	0.984	8"	4.00"	RKT-8400A	\$ 179.01
10"	0.630	12mm	1.181	10"	2.00"	RKT-10200A	\$ 137.64
	0.630	12mm	1.181	10"	3.00"	RKT-10300A	\$ 177.55
12"	0.709	14mm	1.181	12"	3.00"	RKT-12250A	\$ 213.09
	0.709	14mm	1.181	12"	4.00"	RKT-12400A	\$ 346.86
12"	0.827	16mm	1.181	12"	3.00"	RKT-12208A	\$ 193.95
	0.827	16mm	1.181	15"	4.00"	RKT-12408A	\$ 346.86
15"	0.866	20mm	1.690	15"	2.50"	RKT-15250A	\$ 518.82
	1.005	20mm	1.690	15"	2.50"	RKT-15251A	\$ 518.82
3.0mm x 60° Serrations							
18-21"	0.984	20mm	2.362	21"	4.00"	RK3-21400A	\$1,180.98
	0.984	20mm	2.362	24"	4.00"	RK3-24400A	\$1,643.58

USST SOFT CHUCK JAWS

For Kitagawa, Strong, Samchully, MMK & Seoam Chucks

- For CNC lathe chucks with 1.5mm x 60° serrations or 3.0mm x 60° serrations
- Available in steel or aluminum
- Additional heights available
- Custom jaws made to order!
- Aluminum jaws made in USA!



IN STOCK! READY TO SHIP!

QTY DISCOUNTS 5% OFF
5 Sets or More Soft Jaws!
(Must be same part number)

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	\$ 28.67	KT-6150F	\$ 25.02
	0.472	M10	0.787	3.00	3.00	KT-6300AF	\$ 44.41	KT-6300F	\$ 49.04
8"	0.551	M12	0.984	2.00	3.75	KT-8200AF	\$ 41.64	KT-8200F	\$ 44.36
	0.551	M12	0.984	2.00	4.00	KT-8201AF	\$ 50.36	KT-8201F	\$ 51.08
10"	0.630	M12	1.181	2.00	4.50	KT-10200AF	\$ 48.53	KT-10200F	\$ 49.96
	0.630	M12	1.181	3.50	5.00	KT-10300AF	\$ 63.52	KT-10300F	\$ 72.26
12"	0.709	M14	1.181	2.00	5.50	KT-12200AF	\$ 79.97	KT-12200F	\$ 78.48
	0.709	M14	1.181	3.00	5.50	KT-12300AF	\$ 102.72	KT-12300F	\$ 117.68
12"	0.827	M16	1.181	2.00	5.50	KT-12208AF	\$ 79.97	KT-12208F	\$ 78.48
	0.827	M16	1.181	4.00	5.50	KT-12408AF	\$ 115.05	KT-12408F	\$ 142.15
15"	0.866	M20	1.690	2.50	6.50	KT-15300AF	\$ 139.17	KT-15300F	\$ 166.07
	1.005	M20	1.690	2.50	6.50	KT-15301AF	\$ 148.82	KT-15301F	\$ 166.07
3.0mm x 60° Serrations									
18-21"	0.984	M20	2.360	2.50	7.00	K3-21250AF	\$ 148.34	K3-21250F	\$ 188.67
	0.984	M20	2.360	6.00	7.00	K3-21600AF	\$ 368.58	K3-21600F	\$ 491.06

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

USST AMERICAN STANDARD TONGUE & GROOVE CHUCK JAWS

For Bison, Buck, BTC, Cushman, TMX, PBA & Rohm Chucks



IN STOCK! READY TO SHIP!

100% Made In The USA!

- Many more sizes & styles available
- American Standard tongue & groove
- Chuck Jaws stocked in California & Michigan!
- **100% MADE IN THE USA!**

Chuck Size	Groove Width	Tongue Width	Screw Size	Hole Space	Hgt Inch	STEEL SOFT JAWS		ALUMINUM ROUND JAWS		
						Part Number	Set Price	Pie Dia	Part Number	Set Price
6"	.312	.499	3/8	1.500	2	TG-6200F	\$ 45.81	6"	RTG-6200A	\$ 83.56
					4	TG-6400F	\$ 78.83	8"	8-RTG-6400A	\$ 173.12
8"	.312	.499	3/8	1.750	2	TG-8200F	\$ 24.37	8"	RTG-8200A	\$ 113.15
					3	TG-8300F	\$ 70.88	10"	10-RTG-8300A	\$ 261.96
10"	.501	.749	1/2	2.125	2	TG-10200F	\$ 37.21	12"	12-RTG-10200A	\$ 201.58
					4	TG-10400F	\$ 82.86	15"	15-RTG-10400A	\$ 661.69
12"	.501	.749	1/2	2.500	2.5	TG-12250F	\$ 79.44	15"	15-RTG-12250A	\$ 538.58
					4	TG-12400F	\$ 112.59	18"	18-RTG-12400A	\$ 902.79
15"	.501	.749	5/8	3.000	2.5	TG-15250F	\$ 95.95	21"	21-RTG-15250A	\$ 962.58
					4	TG-15400F	\$ 125.11	24"	24-RTG-15400A	\$ 1,643.58

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



FOR QUICK JAW CHANGE CHUCKS

- Hardened base jaws for quick jaw change hydraulic chuck
- Straight serrations
- For Metric tongue & groove top jaw mounting
- For SMW-Autoblok® KNCS, Rota THW Plus, Röhms® DURO-T & ATS Systems quick jaw change chucks

BASE JAWS



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

ALSO AVAILABLE!



HARD JAWS

For 1.5mm x 60° Serrations Chucks

- Designed for first operation roughing, expect runout between 0.005-0.010
- Reversible- for OD & ID workholding
- 2 steps (1 step hard jaws also available)
- Ground body for improved run-out
- GRIP-RITE OEM Style with ground tips
- **XTRA BITE:** Very aggressive bite with conical teeth for extra gripping



Chuck Model	Chuck Dia	GRIP-RITE OEM STYLE		XTRA BITE	
		Part Number	Price Per Set	Part Number	Price Per Set
B206, HS06	6"	KT-60HJ2-U	\$262.95	KT-60HJ2-X	\$274.51
B208, HS08	8"	KT-80HJ2-U	\$315.15	KT-80HJ2-X	\$334.60
B210, HS10	10"	KT-100HJ2-U	\$360.16	KT-100HJ2-X	\$396.37
B-12	12"	KT-120HJ2-U	\$419.43	KT-120HJ2-X	\$444.50
B-212, HS12	12"	KT-128HJ2-U	\$418.28	KT-128HJ2-X	\$445.43
B-15	15"	KT-150HJ2-U	\$540.24	KT-150HJ2-X	\$593.69



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www.ussuptools.com email: sales@ussuptools.com



POWER CHUCKS

Strong FREE SHIPPING!*

- STRONG® N200 Series Interchangeable With Kitagawa® B-200 Series Chucks
- Available in 2, 3 & 4 jaw models
- Higher gripping force and larger bore
- ISO 9002 certified
- STRONG® replacement parts available and interchange with Kitagawa® B200 series chucks

6" Chucks
w/ A2-5 Mount

\$1,781.00
each

Part # K-206A05-N-B

8" Chucks
w/ A2-6 Mount

\$2,040.00
each

Part # K-208A06-N-B

10" Chucks
w/ A2-8 Mount

\$2,678.00
each

Part # K-210A08-N-B

*Free ground shipping. Kitagawa® is a registered trademark of Kitagawa-NorthTech

COLLET PADS & TOP JAWS



Warner & Swasey Collet Pads
Prices Starting At:
\$75.65 Set

Part # CP-WS3RM02500-Y



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

"S" Style Collet Pads
Prices Starting At:
\$76.73 Set

Part # CP-S12RM02500-Y

Top Jaws For 8" CNC Chucks
Prices Starting At:
\$577.50 Set

Part # CPJ-KT0800WS4-U



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!



CNC COLLET CHUCK SYSTEM

Use 5C Collets On Your 3-Jaw Power Chuck!

- Available for 6", 8", 10" & 12" CNC lathe chucks
- Allows you to use your 5C collets on your 3 jaw chuck
- Easy Installation! Includes master jaws & sleeve
- Saves you time and money!
- **MADE IN THE USA**

Chuck Make/Model	Size	Part Number	Price EA
B206, N206	6"	ED-MJSK6LA	\$783.75
B208, N208, HS08	8"	ED-MJSK8LA	\$783.75
B210, N210	10"	ED-MJSK10LA	\$783.75
HS10	10"	ED-MJSK10HA	\$783.75

Additional systems available. Please call for more information.

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

EDGE TECHNOLOGY 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

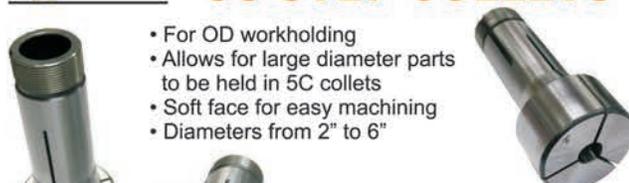
16C & 3J ROUND Collets
\$59.00 ea

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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Tungaloy CARBIDE TURNING INSERTS



- **AH120**-The "Super Grade" for steels, stainless and super alloys!
- **TM** Chipbreaker-Medium cutting of steels and hi-temp alloys
- **SM** Chipbreaker- Medium cutting of mild steels and stainless

COMPLETE LINE AVAILABLE!

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
VNMG431	.015	AH120	TM	Super Alloys	TO-3277	\$8.94
VNMG432	.031	AH120	TM	Super Alloys	TO-3338	\$8.94

W/G 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

SPIRAL POINTED TAPS



- Spiral point, 3 flutes, H3 limits
- HSSE-V3 3% vanadium
- Ideal for hardened tool steels such as 4140, H13 & D2
- Up to 35 HRC
- Additional sizes available

Spiral Pointed- H3 Thread Limits

Size	# flutes	Part Number	Price EA
6-32 NC	3	SOWA-123-300	\$ 6.72
8-32 NC	3	SOWA-123-302	\$ 6.72
1/4-20 NC	3	SOWA-123-308	\$ 7.44
5/16-18 NC	3	SOWA-123-310	\$ 8.40
7/16-14 NC	3	SOWA-123-314	\$ 12.32
1/2-13 NC	3	SOWA-123-316	\$ 14.24
5/8-11 NC	3	SOWA-123-318	\$ 25.84

SOLID CARBIDE ENDMILLS



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



Dia	LOC	Shank Dia	OAL	4 Flute TiAIN 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 • TiAIN 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

					For STEELS	
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!

EXL DEBURRING WHEELS



- 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



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

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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KURT 6" MACHINE VISE



- 6" vise, full 9" opening
- Narrower body style allows for more vises on the machine
- 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!

KURT DX6

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 \$14.33 per pair!

SAVE UP TO 15%!

Length	Height	Width	Part Number	Reg. Price	PROMO!
6"	2"	3/4"	VJ-601-10	\$167.60	\$143.32
6"	2"	1"	VJ-602-10	\$186.10	\$159.11
6"	2"	1-1/4"	VJ-603-10	\$220.10	\$188.19

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



Dia	Proj	BALANCED TO 15,000 RPM		BALANCED TO 20,000 RPM	
		KINGSTON Part Number	Price Each	SPIN TRU Part Number	Price Each
1/8"	1.75"	C40-01EM175-K	\$ 59.23	C40-01EM175-KB	\$ 76.99
3/16"	1.38"	C40-18EM138-K	\$ 59.23	C40-18EM138-KB	\$ 76.99
1/4"	1.38"	C40-25EM138-K	\$ 54.95	C40-25EM138-KB	\$ 76.99
	1.75"	C40-25EM175-K	\$ 59.23	C40-25EM175-KB	\$ 76.99
5/16"	1.38"	C40-31EM138-K	\$ 59.23	C40-31EM138-KB	\$ 76.99
3/8"	1.38"	C40-37EM138-K	\$ 54.95	C40-37EM138-KB	\$ 76.99
	2.50"	C40-37EM250-K	\$ 59.23	C40-37EM250-KB	\$ 76.99
1/2"	1.75"	C40-50EM175-K	\$ 59.23	C40-50EM175-KB	\$ 76.99
	4.00"	C40-50EM400-K	\$ 59.23	C40-50EM400-KB	\$ 76.41
5/8"	1.75"	C40-62EM175-K	\$ 59.23	C40-62EM175-KB	\$ 74.89
	3.00"	C40-62EM300-K	\$ 59.23	C40-62EM400-KB	\$ 80.32
3/4"	1.75"	C40-75EM175-K	\$ 59.23	C40-75EM175-KB	\$ 76.99
	3.00"	C40-75EM300-K	\$ 59.23	C40-75EM300-KB	\$ 76.99
1"	1.75"	C40-10EM175-K	\$ 59.23	C40-10EM175-KB	\$ 76.99
	6.00"	C40-10EM600-K	\$ 66.49	C40-10EM600-KB	\$ 81.92

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!



QUANTITY DISCOUNTS
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

Accu-Collets™ ER COLLETS



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



COLLET SETS ALSO AVAILABLE!

ER 11/ER 16 Prices Starting At: \$8.75 each OLD Price: \$16.50	ER 20/ER 25 Prices Starting At: \$9.75 each OLD Price: \$18.00	ER 32 Prices Starting At: \$10.25 each OLD Price: \$18.00
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ULTRA PRECISION (0.0002" TIR) COLLETS ALSO AVAILABLE!





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**Does your shop miss out on opportunities because you don't have the right CMM?
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ALTERA C comes in three sizes, and is designed with a wide range of multi-sensor technology in mind to meet customer applications and budgets. All are priced less than you might expect, and are ready to unleash the potential of your shop.

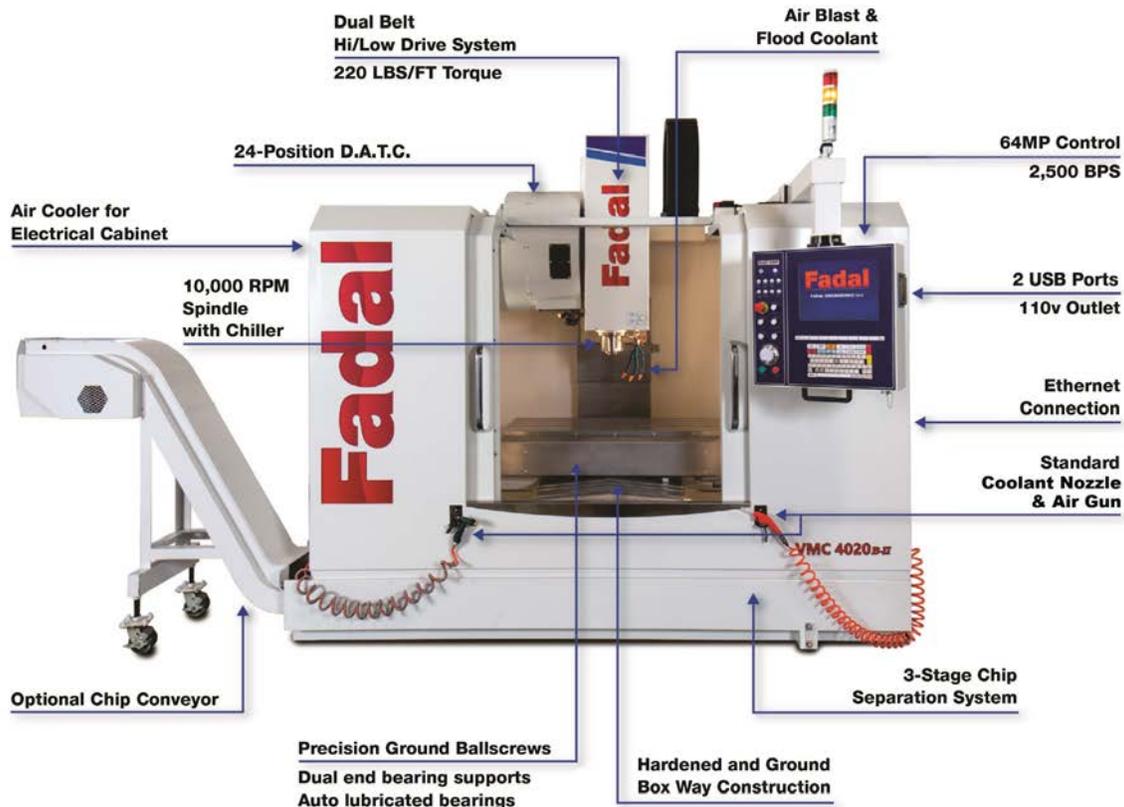
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- Dual belt high / low drive system
- Best in class 220 lbs/ft spindle torque
- Dual supported & pretensioned ballscrews
- Auto lubricated ballscrew & bearings
- Monitored lubrication system
- Three stage chip separation
- Coolant nozzle & air gun

Fadal 64MP Control

- 2500 BPS processing speed
- High speed software
- Coordinate rotation and scaling
- Custom macros
- Spare M functions
- Ethernet port plus two USB ports
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ANGLE HEADS



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Thread Grinding Machine Offers Flexibility and Speed



Mitsui Seiki's GSH 200A thread grinding machine combines flexibility of application, high processing speeds and consistent precision to complete an extensive selection of threading jobs, according to the company. The GSH 200A is engineered to handle a wide variety of workpiece sizes. Maximum diameter swing over the machine table is 480 mm and distance between centers is 2,250 mm, enabling the machine to grind a maximum screw length of 2,000 mm and maximum workpiece diameter of 200 mm.

The machine's capabilities include a 15 kW direct-drive motor that produces maximum wheel spindle speed of 6,000 m/min. X-axis stroke of 330 mm features a rapid feedrate of 5 m/min, Z-axis stroke is 2,150 mm with 10 m/min rapid feed and maximum work spindle speed is 200 RPM.

Sliding machine surfaces are hand-scraped to maximize precision. In addition, multiple systems minimize thermal displacement that can affect thread accuracy and consistency. Lubricant in the table feed lead screw and shaft core stabilizes temperatures of those components. A main coolant nozzle cools, lubricates and removes sludge at the grinding point, while separate work area and bed coolant showers equalize internal machine temperatures. Oil and air lubricate and cool grinding wheel axis bearings.

The GSH 200A machine is compatible with both oil-based and water-soluble coolant, selectable when the machine is produced.

The GSH 200A permits users to apply CBN as well as standard grinding wheels, facilitating grinding of hardened steels as well as unhardened workpieces. "CBN can grind more than 2x faster than standard wheels while providing longer grinding life, which extends the dress-

ing interval and reduces dressing time per workpiece. Mass production scenarios multiply those benefits," said a company spokesperson. Maximum diameter for standard wheels is 460 mm and peripheral speed is 60 m/sec while maximum CBN wheel diameter is 380 mm and peripheral speed 120 m/sec.

The machine's 3-axis NC dresser employs two linear axes (U and W) and one rotary axis (B) to produce highly accurate profiles in both CBN and standard wheels. According to the company, a disc-type rotary diamond dresser provides significantly longer dresser life than single point diamond.

Automation features on the GSH 200A include an automatic phase adjuster, automatic notch position adjuster and automatic effective diameter adjuster. Together, the features permit an operator to leave the machine rather than remaining there to adjust the steady rest and oblique diameter during the operation. The auto effective diameter adjuster uses a touch probe to contact the thread groove and measure change in diameter by scanning. An acoustic emissions (AE) sensor built into the wheel spindle provides automatic wheel in-feed position adjustment.

An optional heavy grinding wheel replacement support mechanism facilitates safe and easy grinding wheel and flange changeovers.

The machine's FANUC 31i-B control features a 375 mm touch panel LCD with the newest Human Machine Interface (HMI) technology. Users can move the panel to where it is most convenient to operate.

Mitsui Seiki USA Chief Operating Officer Bill Malanche said, "The GSH 200A combines high performance with flexibility and solid accuracy. It is a highly-productive workhorse thread grinding machine for a wide variety of applications."



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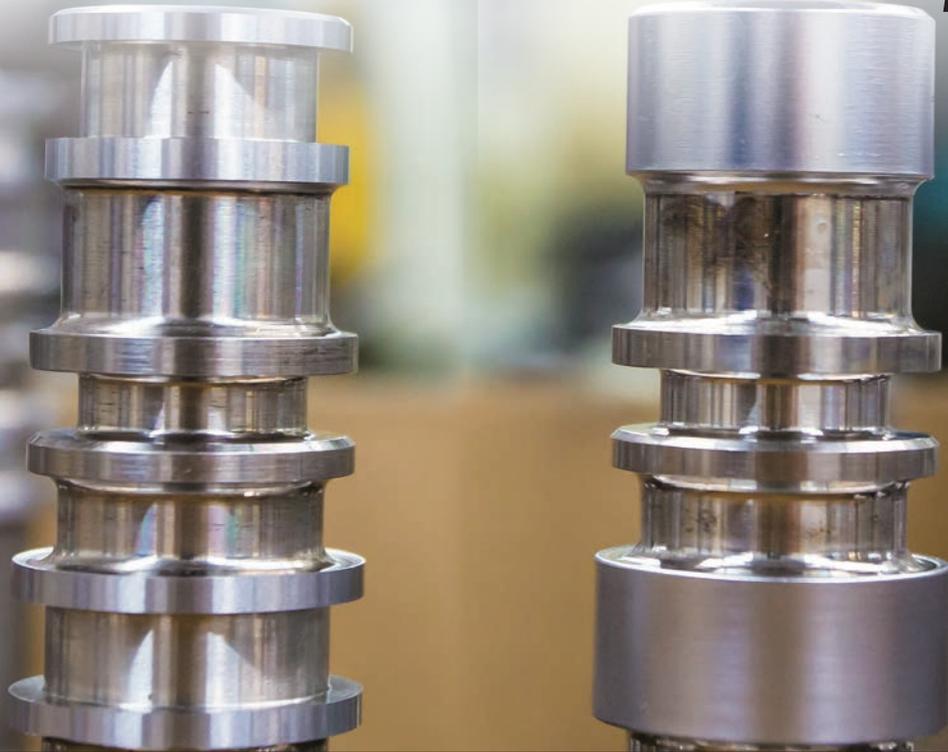
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CORONADO MANUFACTURING, LLC.



REINVENTING THE COMPANY IN THE EYES OF THE CUSTOMER.

Dale Carruthers is the CEO at Coronado Manufacturing, LLC. and has been there for a little over two years. He's spent his career in various industries in a variety of positions, but to simplify things, he is a problem solver. You can tell right away he likes helping people solve their problems. "My position as CEO at Coronado is a humbling experience," explains Dale. "It isn't about me; it is about the people I'm around. It's about finding solutions, jelling as a team, and building relationships. For 61 years we've manufactured standard sized, tight tolerance, medium to high complexity parts. We primarily serve the aerospace, medical and telecom industries, but honestly our core competency is in servicing the customer."

Coronado Manufacturing is owned by the Bay Area investment firm VOPNE Capital. VOPNE in Icelandic is a noun meaning "a weapon used to gain advantage in a contest or battle." Dale started here on day one with VOPNE and the influx of capital has been a great advantage for this So-Cal based company. You don't make it 60 plus years in business without doing things right, but sometimes you need more to grow more. "VOPNE is about investing in the right technology to make businesses create value and do things better," explains Dale. "VOPNE

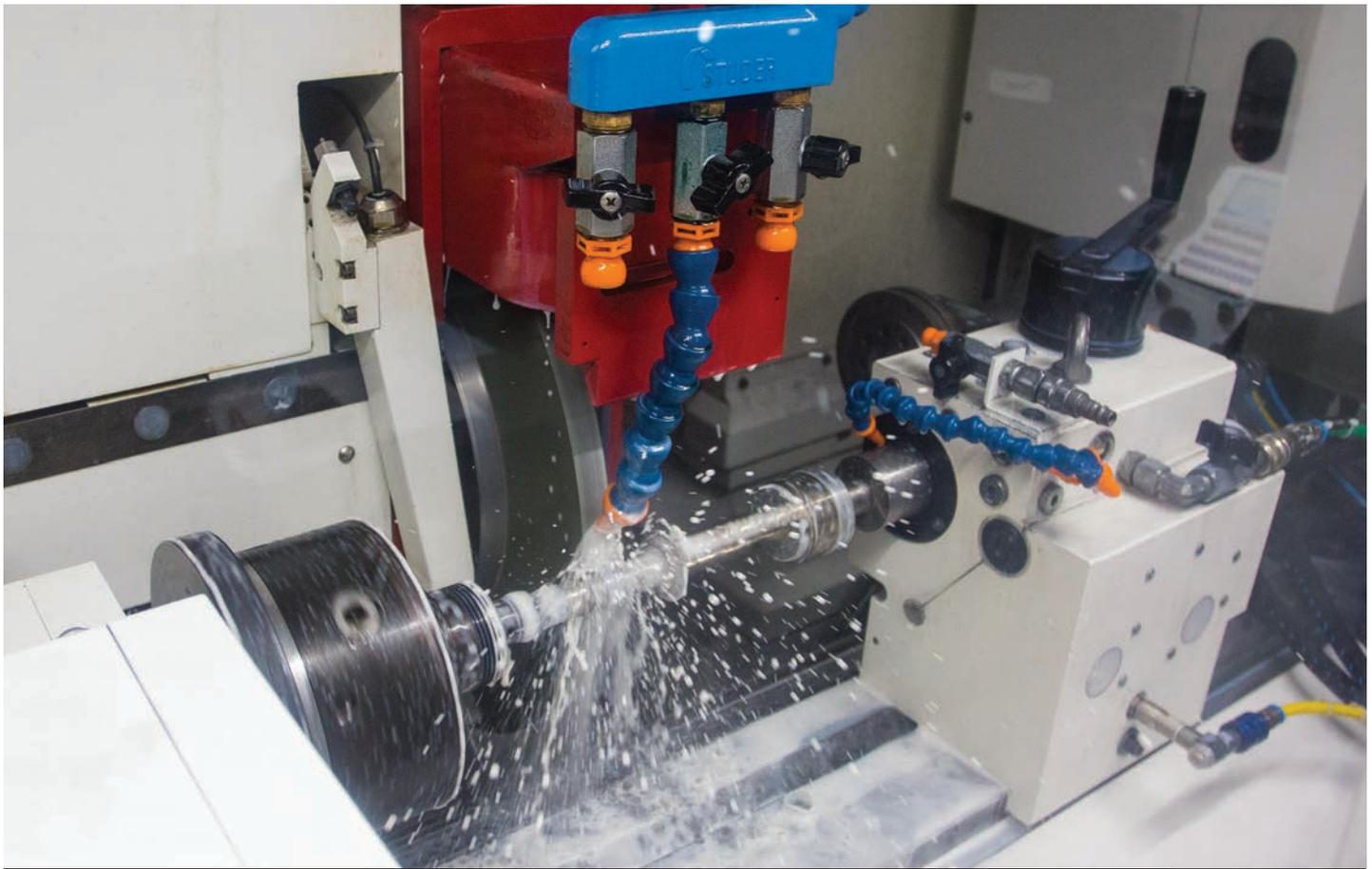
identifies companies with potential and helps them grow. I had a snapshot of operations in my first 3 months here, but here at Coronado we never look back, we always move forward. From day one, reinventing the company in the eyes of the customer has been my top priority."

Coronado is on the rise because they are flexible enough to help customers when they really need it. As a company of modest size with 15,000sq.ft., 42 employees, and 30+ CNC machining centers, Coronado are not burdened down by bureaucracy. Many times, a solution is just a phone call away. "Flexibility means different things to different companies," tells Dale. "For us it means being able to respond quickly to our customer's needs. My phone rings and I will do everything I can to assist and make your problem go away, or at the very least be less of a problem. We are fortunate enough to be able to come through for customers when their own manufacturing centers are overflowing, or when other vendors are leaving them in a bad place. Flexibility means I get the call, I meet with the team, we decide on a course of action, and put than plan into effect. We've been able to act fast to get parts done when others haven't. Our customers love that, and we've earned new business because of it."

With a shop full of mills, lathes and grind centers,

The Studer S33 cylindrical grinding machine comes standard with a touch screen control and the latest software technology from Studer, StuderWIN. Coronado's operators have gone through instructional training, and process training, to make it a repeatable process no matter which employee is running the machine.





The turret wheel head has several grinding wheel configurations and Quick-Set for rapid set-up. Setups were reduced by six, saving time and gaining accuracy.

Coronado's "showstopper" is their recently attained Studer S33 cylindrical grinding machine. "I went to see one of our larger aerospace customers and he said that we should check out Studer grinders, and I listened" tells Dale. "Funny thing is we were also looking at a couple Doosan turning options and the President for Advanced Technologies at Ellison Technologies was good enough to connect us with the right people at DMARK Corporation." DMARK is the Southern California rep for United Grinding which includes the Studer line of CNC grinders. Robert Serrano, VP of Sales & General Manager at DMARK Corporation came in to work with Coronado on installation, startup and training. "DMARK wanted to insure everything went flawlessly on this install," describes Robert. "Building relationships with new customers is always a top priority, and it was important that DMARK performed at our best." "We've gotten a lot of support from DMARK throughout the entire process," adds Dale. "Robert coming to this interview shows how much they value our partnership. The S33 is an expensive machine, but we still find it to be a value. There is something amazing about opening a door, loading a part, and knowing it is right every time we press go."

Along with milling and turning Coronado has a full grinding department. They are no strangers to the grinding process. They grind parts all day, every day, but the Studer

is a different beast all together. "We got the Studer S33 a little over a year ago," continues Dale. "It was a big step up for us in performance and features. We have manual machines, semi-automatic grinding, and now an industry leading precision CNC Studer grinder. It was like we were driving a Chevrolet and now we are racing a Lamborghini. Nothing wrong with the Chevy, very reliable, gets you where you need to go, but it isn't a Lambo. The Studer is a Lambo. People know you are serious about grinding when they hear Studer. The name alone adds credibility, and we are very credible. Customers right away were impressed when we told them about our new S33. It is performing so well for us that we are in conversations to get more."

The Studer S33 is designed to reduce setup and resetting costs on single-part or small-batch production runs. The turret wheel head has several grinding wheel configurations and Quick-Set for rapid set-up. The S33 has C axis capabilities when equipped, as well as a thermostable Granitan®S103 mineral-casting machine base. Each S33 comes equipped with touch screen controls and the latest software technology from Studer, StuderWIN.

The S33 is super versatile, but Coronado purchased it for a single part. They went from seven grinding set-ups down to only one, and reduced run time by more than 50%. The part they are making is both an OEM and aftermarket

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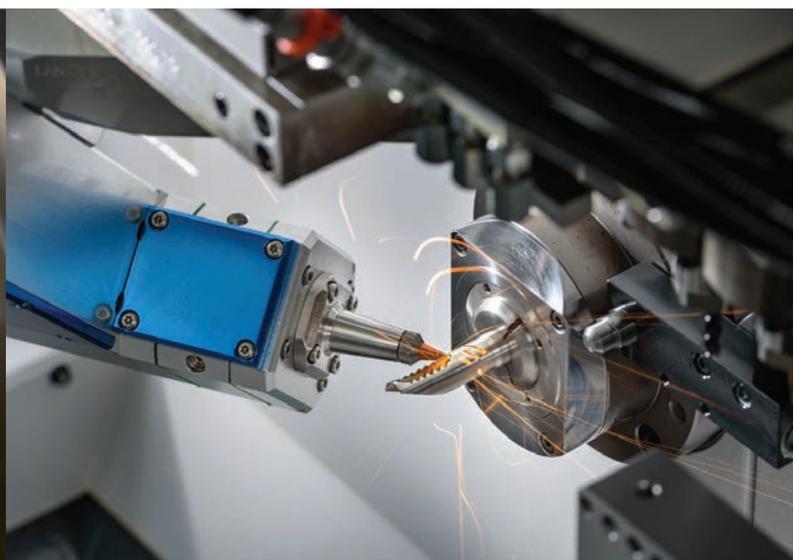
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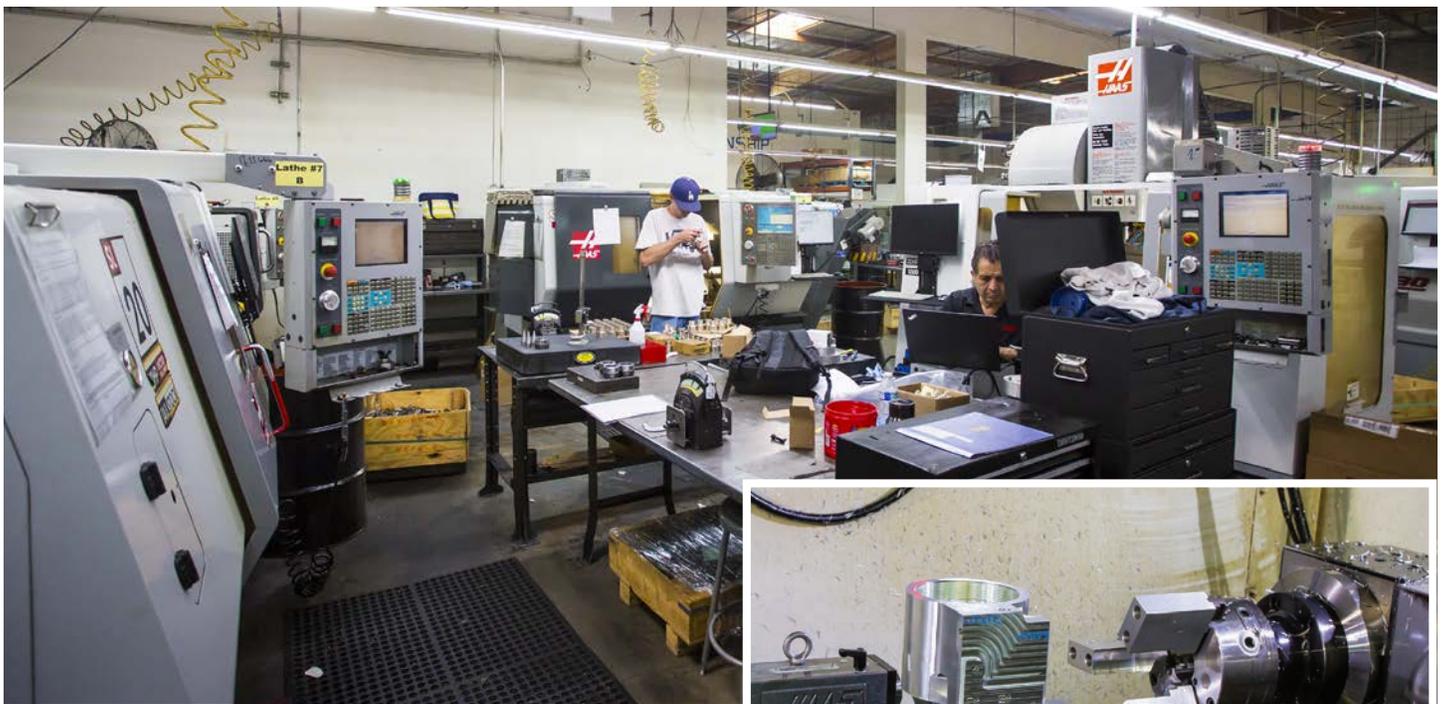
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Above - Coronado now works in cells. They discovered that a large portion of their parts required 3 lathe ops and one milling op. So now most cells are 3 plus 1.

Right - The majority of Haas milling centers are being retrofit with 4th axis capabilities. 2021's main goal is to reduce setups by one on the top 100 jobs.



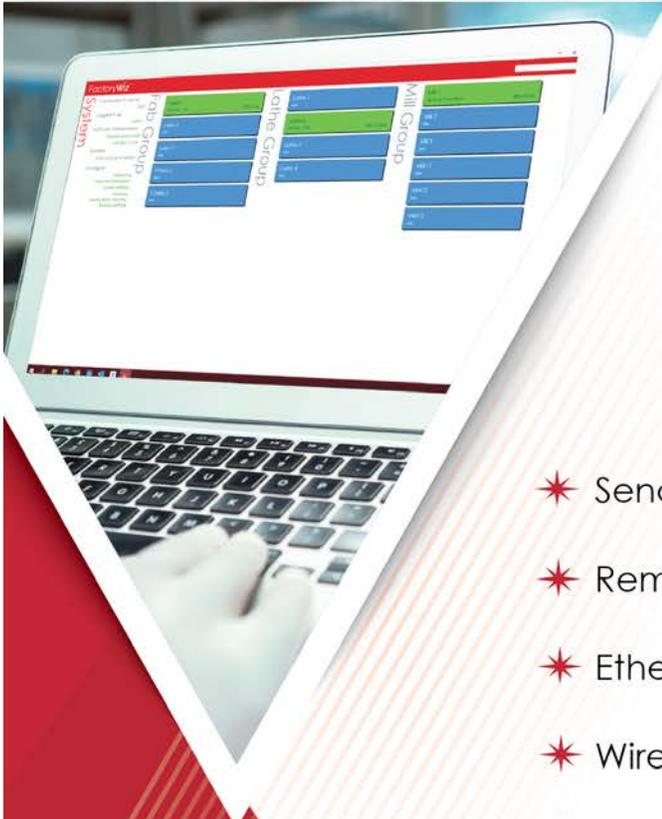
aerospace item that needs to be replaced after a certain level of usage. With no one really flying the last year they did put a different part on the S33 for a little while, but as the manufacturers ramp back up production, all the machine's time is back spent on this single part again. "We get a slug and remove a lot of metal on it before it even goes to the Studer," explains Dale. "The S33 then adds grooves and grinds the OD in a few places. All in a single setup. Tolerances on the part are tight, within tenths. A lot of what we do is tight, way tight. Long parts with grooves and high surface finishes. To the untrained eye the parts don't always look impressive, but we have craftsman who make it look easy." Coronado's operators have gone through instructional training, and process training, to make it a repeatable process no matter which employee is running the machine. "Running the Studer isn't as simple as anyone can do it, but we are making it so once you are trained the processes are repeatable," clarifies Dale. "This week we have second shift people getting trained to run the Studer while they are also running the lathes."

Coronado runs thousands of this part a year, and like everyone else, chase improvements measured in seconds. The production gains running the S33 have been huge. Dale quantifies the gains two ways, time and accuracy. "We are making better parts faster," explains Dale. "It comes down to time and accuracy. Time X3 and accuracy X2. We've reduced a seven-setup job down to a single setup saving time. It also reduces the probability of human error, thus also increasing accuracy. The S33 is dramatically faster

and can hold tighter tolerances compared to the machines it was running on before. Our grinding time dropped by over 50%, and we are producing a better part at those speeds. Time again comes from our operator now being able to load the part and then work on something else for the 15-minute cycle time. We work in cells typically and the grinding department is no different. We are getting much better production from our operators being able to multitask, reallocate their time, and ultimately have better throughput and productivity at the end of the day. We verify all this with our shop wide Factory Wiz and Pro Shop software.

Dale has a philosophy; working with the customer doesn't have to be hard. Good parts, on time, at a reasonable price. If you aren't working on one of those things, then what are you doing? He also has what can only be described as a reverence. When someone needs help, help them. "When the customer needs help, listen to them, help them," concludes Dale. "Look back on the day and challenge yourself and make it a better place. There is a lot that goes into that. It is Sue in purchasing who stayed late to finish a project, it's Gary out in the shop that is having a bad day, it's a customer needing a part tomorrow. It's how can we help make this a better place every day." From the top down, Coronado Manufacturing, making this a better place every day.

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MILLER MARINE

Article & Photos by Sean Buur



LAND AND SEA ARE NO MATCH FOR MILLER MARINE

Since 1989 Miller Marine Inc. has been on and below deck at California's famed San Diego waterfront. Ed Senter left his job to start his own company. He asked coworkers to come with him and no one did. He opened Miller Marine as its first and only employee. Today, Miller Marine employs 100 plus men and women on the waterfront, and in their nearby 20,000sq.ft. manufacturing facility. Miller Marine is predominantly known for structural retrofit and repair on US Navy vessels, but their capabilities are far vaster. Pipe, sheet metal, milling, water jet, electrical, and UIT (Ultrasonic Impact Treatment) are just a few services available at Miller Marine. With over 150 welding certificates, this NAVSEA, ABS, ASME & AWS Standard Certified, ISO 9001-2015 compliant company can tackle anything the maritime and land-loving sectors can throw at it.

Steve Humphries is Miller Marine's Production Manager. He works closely with both Vice President Seth Siraton and Contracts Estimating Manager Carlos Slaten. Most of the day-by-day operations go through Steve, but the nature and complexity of their work demands a 100% team effort. Steve, like many of Miller Marine's workers got his start on "fire watch," a no-frills entry-level job,

similar to working as a welder's assistant. He spent 20 years welding on ships before taking a decade long stint in the aerospace game. For the last six years he's headed up the production team and is hands on with everything they do. "Nothing we do is easy work," explains Steve. "It's dangerous on the ships, dangerous in the yards, and it's hard. We do a lot of structural; I mean a lot of structural work on these ships. Structural is anything from removing and replacing doors, cutting bulkheads out, and fabricating foundations." A foundation is anything something sits on. The Navy doesn't just put an electrical cabinet on the deck of the ship. It is bolted to the foundation, and the foundation is welded to the ship. Ship repairs have more guidelines, parameters and overviews to follow than the original builder's spec. Miller Marine has a job right now with 366 pages of specs the government mandates they follow. "We don't make a 1000 of a single part," details Steve. "We custom make everything. Even if the ships are identical on paper, they never are when it comes to doing the retrofits. Drawings are different from ship to ship and never the same. A lot of times we roll out to do measurements and the drawings are nowhere near being a match because the boat has undergone multiple changes in the last 40 years." Miller

Miller Marine's MAXIEM 1530 Waterjet is one of the largest machines in the area and is the most versatile CNC in the shop. As a demonstration, Brandon 'Fish' Hartung programs the machine to emboss the CNC West logo into a piece of 1/8 aluminum.

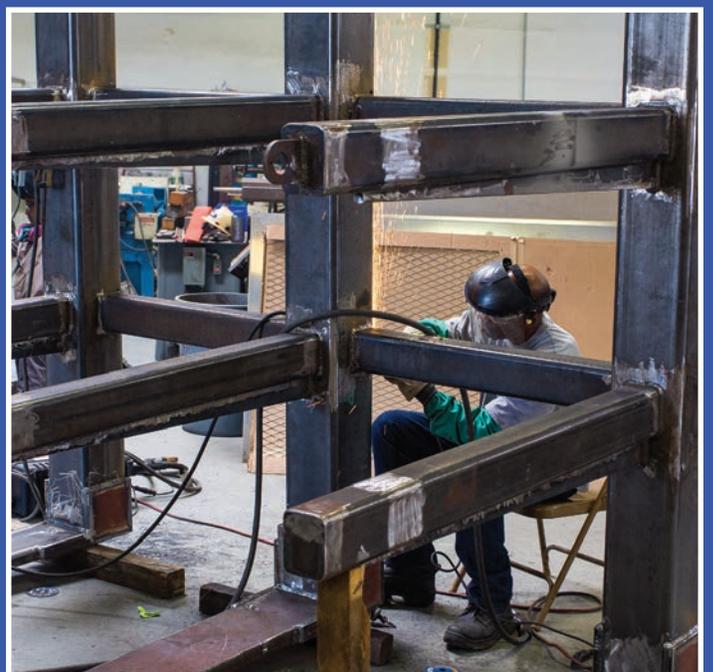


Above - Most of the parts coming off the MAXIEM 1530 waterjet can't be photographed, but here Brandon shows off a piece of artwork and a production run of parts for the home and garden show.



Above - Using the MAXIEM 1530 Waterjet Brandon cuts 9" thick square tubing 8' long as part of a shipside rack system.

Below - Expert craftsman assemble and weld together the rack system. Each piece of steel is perfectly cut to size and requires very little prep work.



Marine retrofits are part of the Navy's AIT program to modernize older ships. When that happens, they might build an entirely new foundation and all the items that go along with it. "What we do has higher standards than OEM," adds Victor Rivera, Business Development at Miller Marine. "We have more tests, need more certs, do more QC and adhere to more governmental oversight than the people who originally built the ship."

Big ships require big machine tools, and Miller Marine is well equipped for jobs on land and sea. "Since most of what we do is structural welding and retrofit on massive ships, we need large support equipment that match the scale of what we do," tells Victor. "Not every job we have, requires the constant use of these massive CNC machines but is well suited for customers requiring a larger work envelope. Our mill is a Haas VF9-40. It is a 4-axis machine and we also have the 5th axis table. It has a 30hp spindle and a large work envelope of X- 84"; Y- 40" and 30" in Z. It can hold a 4000lbs chunk of metal which comes in handy for some of the parts we machine." Their Accurl B40320 press brake is formidable in size and can handle a 13' sheet of metal. With 359.9 tons of maximum force, it bends aluminum or steel like origami. Probably the most versatile machine in their arsenal is the Maxiem 1530

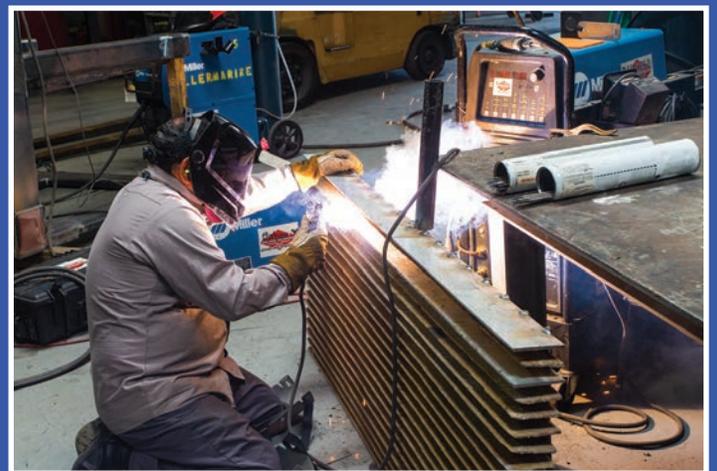


Miller Marine's Haas HAAS VF9-40. It is a 4 axis machine with an added 5 axis table. Because of its size it can hold up to 4000lbs and has a 30HP spindle.

Waterjet by OMAX. With a 10' X 5'2" X-Y work envelope and 12 inches of Z, this beast of a machine can cut steel, aluminum, foam, rubber, plastic etc. up to 10" thick.

Brandon 'Fish' Hartung is Miller Marine's waterjet operator. His skills and creativity were well known in the area and Steve had 'Fish' on the sonar for the last few years. "We are glad Brandon came on board with us in April," touts Steve. "He is a wizard at making the Maxiem perform." Time spent programming and cutting on the waterjet is time saved later in production. Something as simple as a beveled edge on mating pieces of steel mean the welders can just weld and they don't have to spend hours grinding down a corner. "We have a rotational cutting head on the Maxiem 1530," details Brandon.

"Together with the OMAX InteliMAX software we are pretty limitless in what we can do with this machine. Everyone knows you can cut things with the waterjet, but it also has a delicate touch when needed. For example, while you were talking to Victor, Carlos, and Steve; I scanned the CNC West logo and brought it into the software. I created the plate from 1/8th aluminum and embossed the logo into a rounded rectangle. The waterjet can do detail work that doesn't even pierce the thickness of the metal, leaving raised type of your logo." Yesterday Brandon was cutting 9" thick square tubing 8' long and today he was making a decorative art piece. "It is amazing that a huge machine is capable of such a variety of work," adds Brandon. "It is one of the largest waterjets in the



Left - Structural items like doors and bulkheads await their repairs and retrofits. Right - A welder makes repairs to a slatted aluminum floor system.



The Accurl b40320 press brake can handle a 13' sheet of metal. On vent jobs it allows Miller Marine to make three 90 degree bends and only have one welded seam.

area and customers are amazed with what we can make on it. Victor has been doing a great job generating outside sales from local breweries, smaller fabricating companies, aerospace clients and other customized jobs that we have never done before. Between inhouse projects and new customers, we are utilizing the machine to its capabilities. I love it.”

Miller Marine is in a period of growth and in need of qualified people. Typically, they like to promote from within, but they are looking outside right now for programmers and machinists who can handle the 5 axis work on the Haas. “With 80% of our workforce out in the field we are always looking for quality welders,” tells Steve. “We have such a hard time finding people who fit

the Miller Marine way, that we started our own inhouse training program for any of our employees to learn to weld. We start them out on stick welding and see how well they progress. Every Tuesday and Thursday, we pay one of our highly skilled supervisors to teach the class. Some days, it is all the people that perform fire watch duties who want to advance up the chain and other times it’s one person who needs to dial in their TIG work and needs a little hands-on instruction. The waterfront is big here in San Diego, but it is a small community. It is important that our people are the best in the business, and they prove it every day on land and sea.”



Welding is the true art form at Miller Marine. From structural and pipe welding to upside down on a rocking ship, every weld must meet the highest industry standards.



J.E.M. F/X

MAKE ONE - MAKE IT NOW

At 18 Elia Popov went to work at Universal Studios theme park's in-house engineering department as an apprentice. His dad, Paul Popov Sr, taught him to weld at 11 and he's been fabricating since. "The studios have a way to figure out your strengths and I had a real aptitude for electrical and hydraulics," tells Elia. "I did PLC's, electrical panels and whatnot, just working my way up." When he transitioned over from rides to the movie side of the business, he had a lot of experience in automating things that were not really being automated at the time. "When I got into the special effects side of things, they were using a nail, piece of wood and a wire called a nail board, and still do "I came in with a small group of techs using AutoCad and PLCs and started programming automation and people looked at us like we were crazy."

Growing up in and around shops Elia took notes on everything. What worked and what didn't, and why. His dream was to have his own place, and his vision was taking automation to the fore. "No disrespect to the pioneers who came before me, but I saw the studios expanding exponentially and there was no way the industry could

keep up without automation," explains Elia. "I looked at what a company called FXPert's and John Frazier was doing and wanted to do better, and felt that we had to do better. John Frazier was the first to have a CNC mill, the first CNC plasma cutter, he built his own water jet. He revolutionized the industry and set a bar for me to go after. I incorporated in 1995 and I had this wonderful mentor Thaine Morris, a legend in this business. He set me up with a ghetto place in LA and just let me flourish. What you see here is the evolution of an industry that hates evolution. Our predecessors wanted everything the same, copy cat, copy cat, copy cat. My generation came in and said we are going to stop plasma cutting by hand, have shops with proper ventilation systems and automate anything we could for speed and accuracy."

J.E.M. F/X Inc. makes their home in Valencia, California. They have a 30,000sq.ft. building for manufacturing, a 30,000sq.ft. building for rentals, a few acres of outdoor storage, a couple of satellite setups across the country and three fully mobile fab shops for use on set. J.E.M. F/X's current roster of machines include: three Flow water jets, one Haas VF1, one Haas VF5 with 4th axis table, two



Above and left - Currently, the only CNC machines that J.E.M. F/X has three of are the Flow water jets. The versatility and ease of use makes these some of the most useful machines in the shop. All three are 6'x12' and cut everything from wood and plastics to thick steel and aluminum.

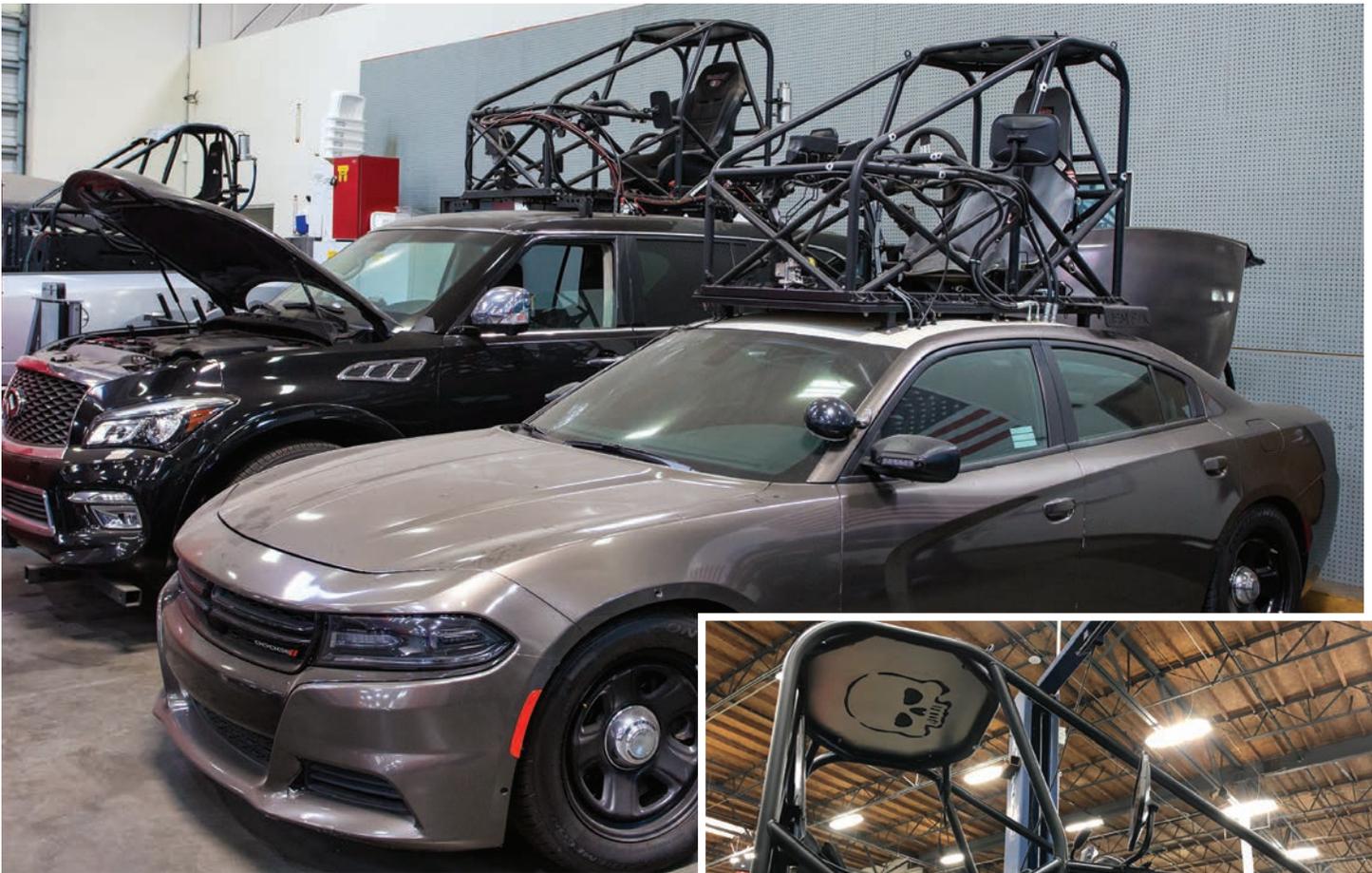


Below - Andrea Crookes is building a bomb box on the laser out of acrylic. "The box gets wired up for pyro," explains Andrea. "The top piece I'm making now is cut, engraved, and etched all on the new laser. Like the water jet and our CNC plasma cutter the laser is one of the machines we rely on a lot. It is quick and easy to program and can do a multitude of things with a single setup. Bomb boxes are custom made for specific tasks depending on the studio's needs."



Boss lasers, Sampson CNC Plasma cutters, a new Baileigh automated tubing bender, a CNC press, one ST20 Haas lathe, mig welding, tig welding, full sheet metal fab and assembly. When you build everything from fog machines and roll cages to pod cars and pirate ships, versatility is a big part of choosing machine tools. "Every machine has to be quick, easy to program, and be useful to the entire shop. We work in steel, aluminum, wood, and plastics. We have three water jets because we need three machines to keep up with the workload. Pretty much everyone in the shop can use the water jets for basic cuts with just a little training. Our more experienced designers can really get a lot out of them. The water jets are one of the most important tools we have. If one is down for service, or God forbid needs a part, the guys cry like little babies even though they still have two others. The Flows have been great over the years for us are reliable as hell. Most of the time if they aren't running it is because someone broke a tip. We've all broken tips, but at J.E.M. F/X we have a big ceremony of shame that goes along with it."

J.E.M. F/X have high school dropouts to guys with a master's in engineering working side by side. Aptitude



Justin Sofio spent his youth racing cars, but today he is an expert fabricator who does everything from modding out off world speeders to driving the double decker car rigs known as pod cars. "We build and rent a lot of pod cars," tells Justin, one of J.E.M. F/X's long time fabricators. "The actors sit in the car or truck and the stunt driver operates the rig from an alternate position. We drive and they act. We built pods for regular cars and futuristic transports, whatever the studio needs."



and attitude are the most important thing in this shop. They employ a few kids with proper engineering degrees that originally came to them via an apprenticeship Elia has with the local high school. "Students shadowed my people after school and worked their summers here before going off to college," chuckles Elia. "They graduate and end up getting a job in a cubicle working for some aerospace company. Most who get the taste of this business find it hard to leave. We offer challenges that wearing a tie and analyzing a bolt in a windowless room just can't compete with. One by one they come back into the family. We break the monotony by the engineer being involved from start to finish. They go to the meeting, design it, program it, feed the information to the team, assemble it and take it to set. They watch it succeed or fail on set, in front of everyone with cameras rolling. I have real engineering companies call and ask what the secret sauce is that I feed my crew. The secret is getting them out of a cubicle and into the action with the people who use it. They won't put the panel in front of the adjuster when they are the one making the adjustment, and everyone is waiting for them."

Phillip has been with the company now for ten years.

Four of those years he spent primarily as a water jet operator. His background was in manufacturing prototype parts for off-road racing, a skill that pays off daily at J.E.M. F/X. "I'm more on the mills and lathe these days, but I still spend a lot of time on the water jets," details Phillip. "All our job titles here are "anything and everything." Wherever they need help you help. Doesn't matter if it is woodwork, sheet metal, laser, design, CNC machining, or even going to set and blowing wind into some actor's hair. J.E.M. F/X is 1000% a team effort." Everything they do at J.E.M. F/X is short run prototype. If they make five of something that is a long run. "We are on a project from start to finish," explains Phillip. "Our job is to interpret what the studio wants, design it, make it, and deploy it in the field. "Make one and make it now" should be our mantra but make one and make it by noon is just as common." Items get used once on camera and tossed in the trash. A good example of this is a crane/winch device Phillip made for the TV Show S.W.A.T. "They had a scene that needed a crane that came out of the back of a pickup truck, got mounted into a hitch receiver and winched people from a mine shaft,"



J.E.M. F/X's has a CNC milling and turning department with a Haas VF1, VF5 and a ST20 Haas lathe. A larger Haas lathe will be the next machine tool purchase for this department. Elia likes how most machinists can run the Haas machines and that Oxnard is only an hour away if they need service.

explains Phillip. "I had nothing else to go on and could build whatever I wanted. I had to design, build and test in under a week. Having a full CNC machine shop is great when building contraptions like this winch system. Many times, the water jet is the quickest and easiest way to cut out the shaped parts you need. We have three pretty identical Flow machines, and they are constantly running. All three have a 6'x12' worktable and some days we use every inch building pirate ship parts. Other days it is small items that are part of a galaxy far far away."

Elia's dad taught him early on if you are going to be a welder, be the best welder, if you are going to push a broom push it the best, if you are going to be a doctor be the best damn surgeon you can. "I still consider myself to be a dumb welder," tells Elia. "But I'd be happy to show you around the shops and my house to see what a dumb welder can do when they apply themselves. Be the best at what you do. Hammer the best nail you can. Make it perfect. Our QC department is shame, humility, respect, and honor. We measure quality in one take, perfect, in the can, and no one got hurt, maimed, or killed." Every year J.E.M. F/X engineer, build, and install upwards of 250 roll cages in stunt vehicles. They are designed to take multiple

beatings that normal people can't even comprehend. "Our cages don't fail because we strive for perfection and treat every one of them like it is our family members in the car," adds Elia. "Would you build this any differently if someone you love was behind the wheel? The answer is always no. We build everything the best way possible because the reality is these stunt people are family, this entire industry is family, and we treat it as such."

Even though he is at the top of his game Elia feels every day is a struggle to make it work. Every morning he thinks this is it, this amazing ride is over. There is a humility that drives him to do more and to do it better. "I never feel like I've made it," concludes Elia. "That motivates me every day. Even though we have jobs in house with every studio, Netflix, Amazon, Paramount, Lucas film. Even though we do pyro, smoke, fire effects, rain, snow and so forth for all the live shows I know there is more we can do. Work hard, make it perfect, invent, create, push harder. We nitpick everything, and it shows in our work and makes this place run at the level that it does. Generations of people, crew, stunt folks, grips, lighting techs, and actors have gone home to their families after filming because we are the best at what we do."



Culture is a big part of working at J.E.M. F/X. The day CNC West was on site it was Elia's birthday with cake and ice cream. They work together, play together and everything is 100% a team effort.



This fire stick was used one time. Phillip had two days to design and produce essentially a wand that shoots a piece of pyro. All the wiring, battery and pyro had to be inside with buttons to arm and fire it.



WET part programmed in ESPRIT. Editor's Note: A video featuring Mark Fuller (President and CEO of WET) and Paul Ricard (Co-Founder and President of ESPRIT CAM) discussing innovation, outsourcing, the changing state of manufacturing, and the importance of adaptation can be viewed at: <https://youtu.be/Mz1r4dhE8Y>

ESPRIT KEEPS THE SUCCESS FLOWING FOR WET

Article & Photos Submitted by:
ESPRIT CAM Camarillo, CA

Founded in 1983 by former Disney Imagineers, Southern California's WET Design creates water features that are quite a few cuts above the fountains you might see at your local mall or city park. Their expansive portfolio is an impressive showcase of what's possible when water, light, music, and human ingenuity come together.

If you've ever scrambled for a prime spot to watch the Fountains of Bellagio in Las Vegas, booked a once-in-a-lifetime experience at The Dubai Fountain at Dubai's Burj Khalifa skyscraper (the tallest building in the world), or stopped to rest at the fountains at Salt Lake City's City Creek Center, you've enjoyed WET's work. WET installations can be found on three continents and have even made an appearance in the opening and closing ceremonies of the 2002 and 2014 Winter Olympics.

The design, engineering and manufacturing teams at WET Design require a varied array of machines to keep their work on the cutting edge and maintain their leadership in the industry. On their shop floor, you'll find a Nakamura NTRX300 mill-turn, ten Haas lathes, ten Haas mills, two Haas horizontal mills, two Mori Seiki NL-2500s, a Makino wire EDM, and a Makino high-speed tooling mill—among others. The variety doesn't stop at their machine tools, either. In order to bring their creations to life, they need to manufacture an incredible diversity of parts, including valves, robotic nozzles, electronic controls, underwater lights, molds, and tooling, primarily from stainless steel. Each WET installation is far more than fountains—it includes a vast underground network of complex parts.

For the last 12 years, WET has relied on ESPRIT to help them work their magic. "When we first got our mill-turn machines in 2008, we researched the software that would be best able to support our programming needs. ESPRIT was the answer," says Oscar Ramirez, a top CNC programmer at WET. "We really needed to program our mill-turn parts to get the most from our machines."

"We program our parts with ESPRIT and we can make them with no editing. Before ESPRIT, we had to do a lot of editing and manual programming to get the machine to make the parts that we needed," says Oscar. "ESPRIT was the solution because I wanted our focus to be on the machining aspect and more effectively planning our schedule in advance rather than spending a lot of time trying to get a project to come out right."

WET keeps their processes in-house, which has a number of advantages—and challenges. "In-house engineering means we're always simplifying our designs to reduce manufacturing costs. But sometimes we just can't simplify, so we have to make some parts on 4- or 5-axis machines," says Oscar. "Our project priorities can turn on a dime. For example, we make parts for our service department, and those take priority. We have to be very agile. We use the machine swap feature to change a setup in multiple machines, even moving setups from one machine to another."

Machine swap is an important component of WET's success on the shop floor. "Machine swap is powerful and keeps us very agile," says Oscar. "One example is a part we call a spider. It was initially programmed and scheduled to run on our Nakamura machine. The assembly rate



WET keeps all their processes in-house, keeping production streamlined

went up when the assembly shop added a second shift, so we had to add a second machine to make more spiders.” Machine swap made adding spider assembly to their Haas Trunnion a quick and seamless process that enabled Oscar’s team to keep up with demand.

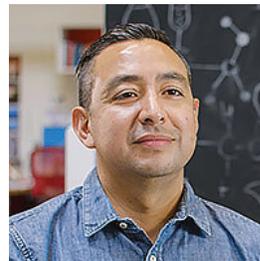
Oscar cites another part when it comes to saving time. “We used to use two machines to make a part called a skillet,” he says. “That required two long setups. With ESPRIT, we moved that part to the Nakamura machine to make it in one go. That saves us about three hours in setup time, and we need one less machine and one less operator, too.”

Oscar and his team have been consistently impressed with ESPRIT’s capabilities, especially when it comes to keeping up with their ever-changing needs. “ESPRIT helped us simplify setups and improve quality by combining several operations into one,” he says. “So we get done-in-one setups and cycles on one multi-axis mill-turn machine. In comparison to making parts one operation at a time on simpler machines, we’re more efficient than ever.”

If Oscar’s team ever encounters an obstacle, he knows he can count on ESPRIT’s renowned customer service. “I don’t hesitate to go to the ESPRIT portal to ask for help,”

he says. “Whether I need help creating a toolpath or need to change a post on our Haas Trunnion, I like the fact that I get a reply the same day and that I know someone is working on it.”

“We’re a project-based company, and sometimes the timeline to develop, produce, and deliver is very short. While we always have a couple of very big projects on the horizon, we expect to get many smaller projects as well,” Oscar says. “As a result of the short turnaround time, we have to constantly keep improving our methods and techniques so we can accommodate these projects, support our existing projects, and keep growing. ESPRIT plays a vital role because we get great toolpaths and the code is correct.”



“We program our parts with ESPRIT and we can make them with no editing. Before ESPRIT, we had to do a lot of editing and manual programming to get the machine to make the parts that we needed.”

Oscar Ramirez, Senior CNC Programmer, WET

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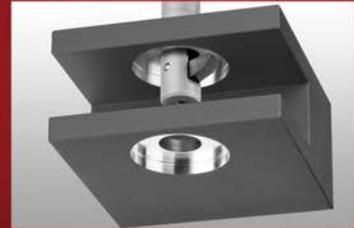
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2018 ZOLLER MODEL SMILE 420



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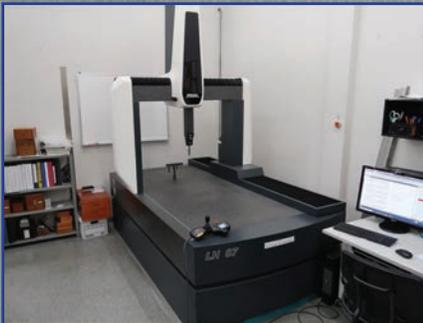
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Industry News

5th Axis Announces New Vice President of Workholding

5th Axis has announced Mathew Evans as its new vice president of workholding. In his new role, Evans will be spearheading operations and strategic endeavors for the workholding division worldwide.

Evans has more than ten years of marketing, sales, and management experience in the

workholding industry. After graduating from San Diego State University with a BS in Business



Administration and marketing, Evans began his career at 5th Axis as a marketing intern and then worked his way to the operations manager position. Since joining 5th Axis, Evans has been a vital part of the team, driving the company's success.

"Mat has shown tremendous leadership capability in his time here at 5th Axis. Focused on helping customers overcome industry challenges, Mat is a perfect fit to lead our workholding division," said Chris Taylor and Steve Grangetto, CEOs of 5th Axis, "he is an asset to the team, and we look forward to his continued support and future growth with the company."

Founded in 2004, 5th Axis Inc. is an industry leader in automated production, manufacturing, and machining. 5th Axis is a turn-key solution provider serving customers around the globe with a focus on product development, milling, turning, assembly, plating, finishing, and logistics.

FABTECH Announces Plans to Return to Chicago's McCormick Place in September

In-person events came to a halt due

to the pandemic, FABTECH will be the first large-scale manufacturing trade show to return to McCormick Place in Chicago, September 13-16. This announcement comes as the state of Illinois moves into its final reopening



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Industry News

phase The event brings all aspects of the metal fabricating, forming, welding, and finishing industries together to showcase the technology, innovation, and solutions they provide.

The economic impact of FABTECH is important to the industries it serves as well as at the state and local levels. "FABTECH is one of the largest events held at McCormick Place, bringing \$73 million delegation spending to Chicago," said Ed Youdell, president and CEO, Fabricators and Manufacturers Association, International. "Our last event in Chicago employed just short of 4,000 laborers with over 110,000 hours of work. This contributed \$5.3 million dollars of labor to the overall Chicago workforce. We are looking forward to bringing these jobs back online."

FABTECH facilitates connections between exhibitors and attendees in or-

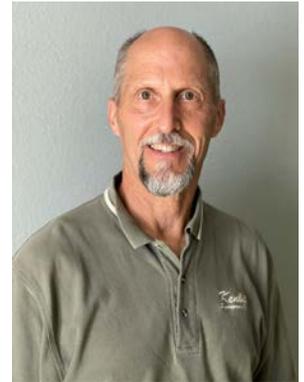
der to conduct business, share knowledge, and showcase the most advanced manufacturing equipment and technology in an unparalleled environment. Attendees will have the opportunity to explore three halls filled with cutting-edge technology, new product debuts, and firsthand product demonstrations from over 1,000 exhibitors.

Mark Drazba Celebrates 40 Years at Kenbil Engineering Inc.

Mark Drazba started at Kenbil Engineering Inc in July 1981 as a territory manager covering Northern California, and Northern Nevada. Over the years he has advanced to his current position of vice president.

Kenbil Engineering Inc has been in the business for over 60 years and is a well-known manufacturer's repre-

sentative agency based in Riverside, California. Their territory includes California, Nevada, Arizona and Utah and they have resident salespeople in all of these states.



Some of the lines represented include ARCH Cutting Tools, ATA, Bondhus, Cogsdill, Eriez, Hougen Mfg, Huot, Jarvis Cutting Tools, Kurt Workholding, Mitee Bite, NSK America, Royal Products, REGO-FIX and Tapmatic.



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Industry News

Mastercam Makes Channel Changes to Better Serve Educational Customers

CNC Software, Inc., developer of Mastercam, has announced that its U.S. industrial channel will now also serve its educational customers throughout the country. This move brings the company's global distribution channel into alignment and supports efforts to bring educational customers and industrial manufacturers closer together.

Mastercam Resellers outside of the U.S. have always serviced both industrial and educational customers within their regions. CNC Software has successfully tested this approach in the U.S. for years in states such as Ohio, Michigan and Iowa. Now, the company has moved all states under the same model.

With this change, educational institutions gain the benefit of greater connection with the industrial network of manufacturers using Mastercam. "They gain direct access to the industrial channel's deep knowledge of the Mastercam product, advanced technical support, post integration, training and onsite assistance," said a company spokesperson.

"Additionally, the Resellers form a much-needed conduit between educational and industrial customers. This connection will enable better partnerships between schools and their local industry, which can lead to more effective and successful job placement for students."

The company maintains an education department dedicated to supporting the educational market through sponsorships and involvement with organizations such as WorldSkills, SkillsUSA, Project MFG, National Robotics League, First Robotics, NASA HUNCH and SAE International, as well as a partnership with TITANS of CNC Academy. The department also

manages the Mastercam Educators Alliance, connecting instructors with each other, training opportunities and

subject matter experts in support of teaching excellence.

The advertisement features a large image of a Jergens 130mm self-centering hydraulic vise. The vise is blue and silver, mounted on a grey base. It has a QR code on the left side. The text "HYDRAULIC CLAMPING SIMPLIFIED" is prominently displayed in large, bold, orange letters. Below it, "JERGENS 130MM SELF-CENTERING HYDRAULIC VISE" is written in white. The background is a gradient of blue and orange. At the top, "JERGENS WORKHOLDING SOLUTIONS" is written in white. The bottom of the ad shows five small images of the vise in different configurations: Vertical, Horizontal, 4th Axis Trunnion, 5-Axis, and Robotic Automation. The text "ONE VISE, MANY USES" is written above these images, followed by "Quick change and secure part holding for multiple CNC machining applications." The Jergens logo and "MANUFACTURING EFFICIENCY" are at the bottom right. Contact information is at the bottom left.

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Industry News

Vision Engineering Inc. Celebrates 40 Years by Helping to Feed America

Vision Engineering Inc. is celebrating its 40th anniversary of the opening of its U.S. headquarters. To commemorate this milestone, Vision Engineering Inc. donated \$40,000 to the national charity, Feeding America, for every Mantis stereo microscope sold from February 6th - March 17th.

“We could not think of a better way to celebrate our accomplishments than to give back to the community. We chose this charity (Feeding America) because food banks across the United States are experiencing an increased demand for support due to Covid-19. People are struggling to put food on the table. The funds we raise from Mantis sales will help food banks across the U.S. supply meals to those in need,”

explained Bernie Sherwill, general manager, Vision Engineering Inc.

Established in 1958 in Surrey, United Kingdom, Vision Engineering Ltd. began by supplying technologically advanced quality control equipment to the defense and aerospace sectors as well as the expanding electronics industry. From 1960-1970 Vision Engineering products were exported to the U.S. to support the substantial growth in the electronics and defense markets. Due to the increasing demand for Vision Engineering products in the U.S., in 1973 founder Rob Freeman set up a joint venture with Kulicke & Soffa U.S.A. (known as Vision Systems Inc.) for OEM integration and distribution with an office in Ivyland, PA.

In 1981 Vision Engineering Inc. was founded and in 1982 the company moved to New Milford, CT, where it currently is based.

In 2019 Vision Engineering expanded its U.S. presence by opening a West Coast Technology Center in Irvine, CA. This site serves as a support, training and demonstration venue.

Chaparral Machinery Exclusive Distributor for Takumi CNC in Texas and NM

Chaparral Machinery is now the exclusive distributor for Takumi CNC machines for the entire state of Texas and New Mexico.

“Takumi CNC machines are the first machines equipped with a FANUC control to offer integrated on-machine inspection probing from Renishaw with no macro programming needed,” said a spokesperson.

The Takumi product line includes:



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ModelMaker H120 and MCAx S arm

Nikon Metrology's class-leading ModelMaker product line of handheld laser scanners has moved another step forward.

Now paired with the new MCAx S portable articulated coordinate measurement arm, this solution is the go-to toolset offering supreme scanning accuracy, detail and productivity for demanding portable 3D inspection and reverse engineering applications.

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the double-column, H-series, suited for die/mold and aerospace and designed and built for thermal stability and rigidity, the VC series general purpose machines for job shops, the 5-axis U-series with the Heidenhain control and SL series box way lathes.

Absolute Machine Tools Earns Diamond Partner Status from Mitsubishi Electric Automation

Absolute Machine Tools, Inc., has recently earned the title of Diamond Partner Systems Integrator from Mitsubishi Electric Automation, Inc., an affiliate of the global manufacturer Mitsubishi Electric that focuses on production solutions.

The Diamond Partnership program is so named for its strength and its multi-faceted approach to automation relationships. These four facets are the customer, the Diamond Partner, Mitsubishi Electric Automation, and Mitsubishi Electric. As a Diamond Partner Systems Integrator, Absolute will have access to a comprehensive software portal to stay up to date on demonstrations and proof-of-concepts; a Systems Integrator Locator to showcase Absolute directly to customers; a hardware demonstration system; a complete software suite for PLC, motion, HMI, VFD, and robot with automatic updates; and a strong support team for product training and technical resources.

Jason Jones, FESG manager of Automotive & Central US at Mitsubishi

Electric Automation conducted the interview that confirmed Absolute's eligibility for Diamond Partner status.

Absolute Machine Tools director of marketing and A+ Automation Team Courtney Ortner said, "Our ongoing contribution to Mitsubishi projects as well as our current and past automation projects were part of our qualifications." Absolute was the only US distributor to partner with Mitsubishi Electric Automation to create and build the LoadMate Plus, a machine tending robotic cell designed to add automation to CNC applications.

Ortner created the A+ Automation Team in response to the growing need for automation and to help manufacturers find the best solutions to meet their production requirements.



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Industry News

“Made in City of Industry” Manufacturing Initiative Launched

The Industry Business Council (IBC) has launched a manufacturing initiative called “Made in City of Industry.” The manufacturing initiative sets out to support existing manufacturers in the city and attract new manufacturers looking to expand their business operations to the West Coast.

“The City of Industry has been a central hub for manufacturing in the San Gabriel Valley, CA. for decades. With the launch of the ‘Made in City of Industry’ initiative, the IBC and the City are renewing their commitment to the manufacturing industry,” said Joanne McClaskey, executive director of the IBC. “We will be

focusing on the issues impacting manufacturers, responding to their needs, delivering ongoing improvements and actively attracting more manufacturers to the city to create a wide range of entry-level and professional jobs.”

The IBC has assembled a top-notch team of experts to create a detailed plan including specific deliverables, target dates and success criteria. The initiative will produce an in-depth study of the city’s top seven industries to identify growth and future expansion trends, including data on current geographical areas where these industries are predominantly located. The study will utilize scientific research to identify the existing competitive advantages of the city as well as the

areas where additional focus is needed.

Unique workforce development programs will be designed to help support the ongoing needs of the manufacturing sector. Training programs will provide the necessary skills and prepare potential employees to develop career paths beyond entry-level opportunities.

DMG MORI USA and Kuraki America Form Exclusive Representation Agreement

DMG MORI USA is now the exclusive sales and service provider of Kuraki horizontal boring mills in 32 out of the 50 states.

DMG MORI USA has formed

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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an exclusive agreement with Kuraki America to represent the Kuraki complete line of horizontal boring mills. In 32 of the United States, DMG MORI USA will be the exclusive sales and service organization of Kuraki horizontal boring mills. Effective immediately, the horizontal boring mill is initiated into the complete portfolio of machining centers and 5-axis machining products of DMG MORI to complement the full needs of the manufacturing base in the USA.

With this new partnership, DMG MORI USA is able to provide horizontal boring mill solutions for some of the extreme machining requirements that only a horizontal boring mill can fill, according to the company. DMG MORI USA includes service and spare parts amenities to customers through the DMG MORI channels. Customers purchasing Kuraki machines also have access to digitization solutions including the free my DMG MORI customer portal and the new my DMG MORI mobile app. The Kuraki machine products that are offered through DMG MORI will also have the same offering of the DMQP support products to make the Kuraki machine product more efficient at start-up.

DMG MORI USA customers interested in purchasing Kuraki products are encouraged to work with their local area sales manager.

Fanuc Announces Production of 750,000th Robot

Fanuc Corporation has announced the production of its 750,000th industrial robot, representing a record high point in the robotics industry.

Currently, Fanuc is capable of producing 11,000 robots per month in fully automated factories that use its own robots to make robots, controllers and machine tools that offer world-

renowned reliability, precision, speed and easy operation.

“With 750,000 robots installed globally, FANUC has become a house-

hold name in manufacturing,” said Mike Cicco, president and CEO, Fanuc America. I’d like to thank our customers, Authorized System Integrators,

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suppliers and employees for helping us achieve such an impressive and important milestone.”

FANUC’s customer base covers a wide range of industries including automotive, aerospace, food and beverage, consumer goods, medical and pharmaceutical, warehousing, and many more. “Now more than ever manufacturers are embracing automation and robotics to solve production challenges. I’m proud to say that FANUC is in a position to meet the growing demands for easy-to-use automation solutions that help our customers increase efficiencies, improve their competitive position, and realize a quick ROI. We look forward to helping as many companies as possible achieve their goals.”

Marubeni Citizen-Cincom Announces New President and COO

As of July 1, 2021, Brian Such has been appointed president and COO of Marubeni Citizen-Cincom, Inc. Brian is not new to MCC and has been a part of their team since 1985. With 36 years of dedication to the company, Brian has been a key member in the support, sales, and management teams.

Marubeni Citizen-Cincom would also like to congratulate MCC’s retired president, John Antignani. John has dedicated over 37 years to the growth and wellbeing of MCC. John will be staying on as an advisor as MCC navigates through this next year. Former president & COO John Antignani stated, “Brian is the only one I trust to carry on our philosophy and take MCC

to the next level.” “He has a strong passion and desire for the industry along with his love and loyalty to MCC which makes him the obvious choice as my successor”.

Selway Machine Tool adds Sinterit SLS 3D Printers to Portfolio

The Selway Machine Tool Additive Department announces that they have added Sinterit SLS 3D printers to their existing product line. Selway reports that Sinterit brings unapparelled part quality, amazing resolution, and 8 different materials to choose from, enabling you to unlock a variety of applications. Sinterit’s mission is to accelerate the adoption of 3D printing by giving organizations affordable

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Industry News

3D printer that makes it possible to create highest quality prints in SLS technology. Sinterit is the world's first manufacturer of desktop 3D printers in professional laser sintering technology and has two models: Lisa and Lisa Pro.

Mazak Distributors Announce Purchase Agreement

Longtime Mazak distributors Smith Machinery and Action Machinery have closed on an acquisition agreement. With the acquisition, Smith Machinery transitions to Smith Machinery Corporation, LLC and joins the Action Machinery group to ensure customers continue to receive the service and support that Smith Machinery has provided for 60 years.

"With Mazak at its core, Action Machinery International, Inc. is positioned to serve both metalcutting and fabrication customers in the Rocky Mountain region. Shared resources among the companies and economies of scale will enable the group to provide even higher levels of support while reducing overall operating costs," said a company spokesperson.

Clark Smith, owner of Smith Machinery, will stay on at Smith Machinery several months during the ownership transition. The company's administrative, sales and applications staff will remain unchanged and provide customers and builders with continued support. Additionally, the company will maintain the longtime service relationship between Smith Machinery and Neotech.

Tom Weaver of Action Machinery will assume responsibilities for day-to-day operations as the new general manager of Smith Machinery. Randy Breitenbach, President of Action Machinery, will take an active role in financial management and leadership.

"The Smith business is an established and successful one," said Breitenbach, "and the combined resources

of our two companies will provide customers with an added layer of service and support in addition to Mazak's own services. More importantly, it will preserve the highly respected Smith company name and its family's stellar reputation in the industry."

Action Machinery International, Inc. was founded in 1982 and has been under the ownership of Breitenbach

since 1994. The company expanded into the Utah market in 2003 and formed a new business called Action Machinery, LLC in 2005 with Tom Weaver as partner and manager. The two companies built their business serving OEMs and job shops in Colorado and Utah, and both have long-standing relationships with leading equipment builders.

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New Products



New Release of Double Vise Converter-S&R Products Company

S&R Products Company launched the “Double Vise Converter”, enabling manufactures to convert their standard 6” machining vise into a double vise in

a matter of minutes. “I really think this product is going to be a game changer,” said Richard Morris, manufacturing engineer at S&R Products Company.

“The response has been great. Distributors and customers alike have had incredibly positive comments about Our products.”

Barry Gerin, owner of PM Industrial Supply, a Southern California distributor recently commented, “An innovative low-cost way to double production”.

S&R Products Company offers a variety of machine shop accessories for the manufacturing industry.



Expanded Range of Toggle Clamps —Jergens

Jergens Inc. expands its range of True-Lok™ toggle clamps with versions that include an additional locking mechanism for added security over a range of applications. Four types of clamps are available with the locking mechanism including Vertical Handle, Horizontal Handle, Pull (Latch) Style and Push (Straight Line) Style toggle clamps. The added feature ensures that the toggle clamp will remain in the closed / hold down position for maximum security in workholding applications. Additionally, it also ensures that the clamps remain in the unclamped / open position to facilitate part change and operator convenience.

True-Lok™ toggle clamps are available with flanged-base in either steel or stainless steel and are suitable for numerous applications in many industries. The secondary lever that actuates this feature has been designed for thousands of cycles and to be easily accessed and engaged by the operator. Holding capacities range up to 7,700 lbs. Twenty-five new line items are offered in total.

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New Products



New Barcode ID Integration—Caron Engineering

Caron Engineering's ToolConnect is a process control system that automatically transfers tool measurement data that is generated by a tool presetter and sends it directly to the CNC control. This system was designed for tools with RFID tags embedded in tool holders as the primary data carriers. Now, ToolConnect can also transfer tool measurement data via 2D (presetter) printed barcode tags.

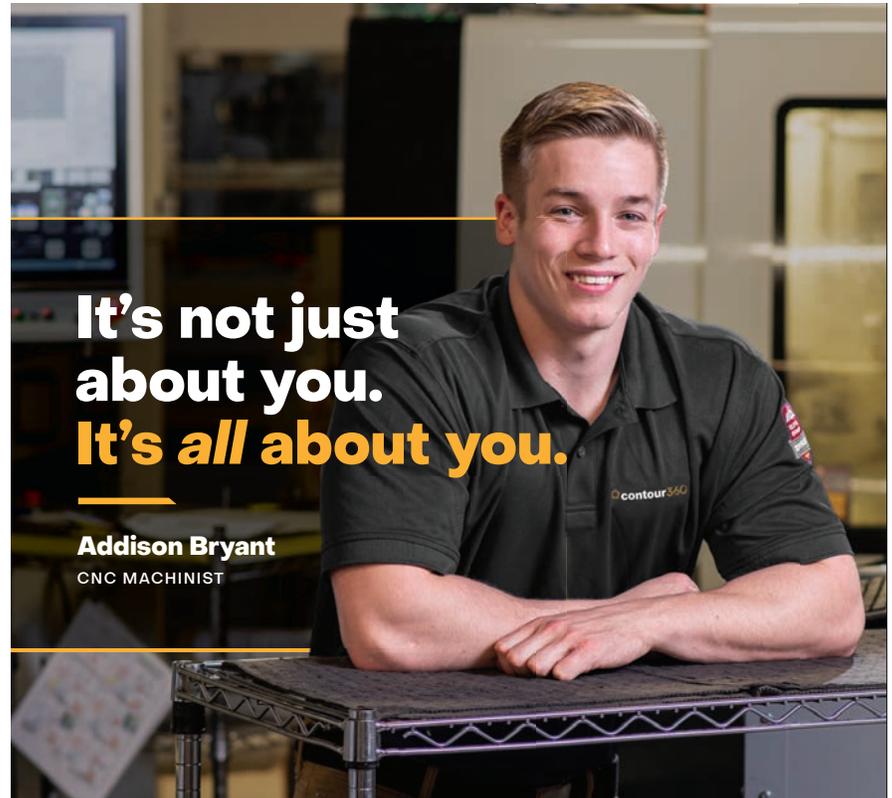
The ToolConnect barcode application uses a barcode scanner at the machine tool to scan the presetter generated barcode. ToolConnect reads and processes the barcode data, displays all tool and process information and then automatically updates the offsets to the correct fields in the control. No operator data entry is required.

In addition to displaying and verifying the tool information on the screen, ToolConnect guides the user through each step of the process to further automate and prevent error. The user screens can prompt the operator through tasks, such as (1) scan the barcode, (2) confirm the tool information, (3) open the carousel door, (4) insert the tool into the (automatically indexed) position, 5) close the door, and other possible scenarios a user requires. The offsets will not be sent to the CNC control until ToolConnect has verified the correct tool is loaded into the machine and each customer-defined step in the process is successfully executed.

With ToolConnect, the system is

designed to fit the users' tool load specifications. This includes customized user screens, process flow, initial setup and system checks, and general access to the system. The system is flexible and can accommodate changes at any time. Additionally, ToolConnect

has an audit log that records every step, action and data exchange, marked with date and time stamp. This data is available locally or via MTConnect; used for quality control and process verification.



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New Products

Mastercam 2022 is Now Released

—CNC Software

CNC Software, Inc., developer of Mastercam announces the release of Mastercam 2022. CNC Software reports that Mastercam 2022 offers more flexible multiaxis improvements, powerful new roughing tools for 2D users, advances in modeling, enhanced intelligence and automation, and much more.

Many of the advancements in Mastercam 2022 are directly driven by Mastercam users and shops. Feedback from Public Beta releases, shop visits, customer surveys, and consultation with their expert industry partners create the practical, shop-driven focus that helps ensure Mastercam users' success.

Improvements include: OptiRough Toolpath for 2D Users. The 3D High Speed Dynamic OptiRough toolpath is now available for all Mill and Router product levels. This allows users to machine very large cut depths with a bidirectional cutting strategy to remove the maximum amount of material with the minimum number of stepdowns. Dynamic OptiRough allows you to create a single toolpath to machine a part, instead of creating multiple 2D operations to achieve the same goal. The toolpath is collision aware of the part.

Faster, more flexible multiaxis programming. Mastercam 2022 adds new techniques and strategies such as the Unified Multiaxis toolpath which allows you to select multiple pieces of input geometry to generate the toolpath

pattern. Using those geometry choices, the toolpath picks the best algorithm to calculate the path. Multi-pass on Deburr toolpaths supports flat chamfered and rounded edges.

Mastercam 2022 introduces powerful mesh creation and editing capabilities that include the ability to reconstruct models from scanned data. And the Overflow UV function allows you to replace multiple surfaces with inconsistent flows with a single surface for flowline toolpaths.

A suite of system-wide enhancements helps automate tasks and speed your workflow. New automatic region chaining uses a "smart" approach to auto-select logical chained areas.

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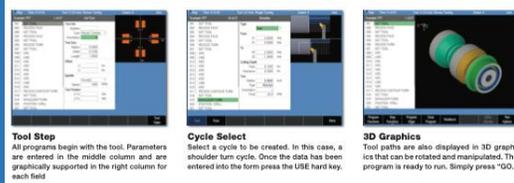
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Tool Step

All programs begin with the tool. Parameters are entered in the middle column and are graphically supported in the right column for each field.

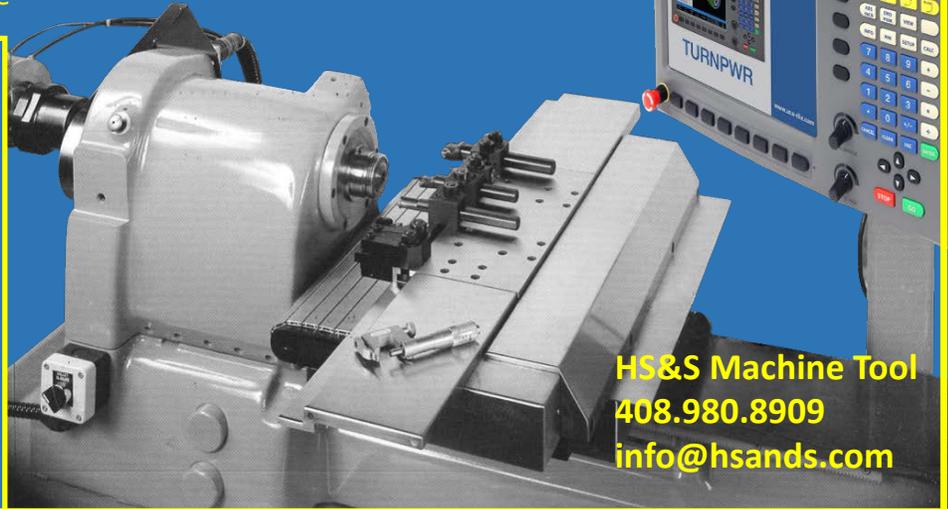
Cycle Select

Select a cycle to be created. In this case, a shoulder turn cycle. Once the data has been entered into the form press the USE hard key.

3D Graphics

Tool paths are also displayed in 3D graphics that can be rotated and manipulated. The program is ready to run. Simply press "GO."

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New Products



Expanded Hydraulic Chuck Offering For Swiss Lathes

—BIG KAISER

BIG KAISER introduced hydraulic chucks for Swiss lathes in 2018. They report that this is the first improvement to the technology in more than 30 years. This year, the program has expanded to include inch-size standard

type chucks, as well as new F Type and R Type chucks.

Standard type hydraulic chucks with tool-side clamping are now available in inch sizes with the clamping range of $\phi 1/8$ ", $3/16$ " and $1/4$ ".

The new F Type's single wrench enables easy cutting tool changes on the tool post. The easy-access rear clamping design is ideal for front tool post. Clamping from the opposite side of the cutting tool and optimum-length design improves overall ease of use. The F Type is available in a clamping range of $\phi 3$ - 10 mm and coolant delivery is possible with an Rc(PT) $1/8$ " screw.

The new R Type eliminates interference at both the upper or lower tool post positions with a unique block design and tightening at an offset posi-

tion in the tool side.

Big KAISER reports to minimize machine downtime and provide operator safety, these hydraulic chucks use a simple hex wrench that requires only two to three turns for both clamping and unclamping. Tightening is complete when the clamping screw hits the bottom; controlling tightening torque is not needed. The company reports that once a hydraulic chuck is centered, the runout will not vary, even if a cutting tool is changed repeatedly. Hydraulic chucks have a standard pipe thread for coolant-through connection and are available for most Citizen and Star machines with $3/4$ " or 22mm straight shank.

Modular Drill for Faster Aerospace Machining

—Kennametal

Kennametal has introduced the FBX drill for flat-bottom drilling of structural aerospace parts. The FBX drill is part of a tooling concept specifically developed to maximize metal removal rates and decrease cycle times when machining aerospace structural components.

"Quickly removing large amounts of material remains a challenge for these types of components," said a company spokesperson. "Traditionally, the first process step is to enter the material by using ramping techniques.

This is a time-consuming process and low metal removal rates are the norm."

"The FBX drill dramatically speeds up the machining process by combining the advantages of a flat bottom drill and a Z-axis plunge mill," said Georg Roth, product manager, Kennametal. "

Once the drill has shaped the basic structure of the component, roughing and finishing with indexable and solid end mills are the next process steps.



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Four effective cutting edges provide stability in challenging applications like chain hole drilling, while large chip flutes help ensure a hassle-free chip evacuation. Supported by a series of exchangeable coolant nozzles to help eliminate heat buildup, the drill point is characterized by a center insert with two effective cutting edges and chip splitters for maximum feed capabilities. The drill bodies are available in diameters of 60 mm, 75 mm and 90 mm, and come in a long and short version (150 mm and 95 mm). This modular drill connects to Kennametal's bolt taper flange (BTF) mount adapters, available in various spindle connection styles.

The FBX is suited for drilling into

solid, chain hole drilling and plunging in a variety of materials such as high temperature alloys, stainless steel and steels and cast irons.

Enhancements to NXT Tool Grinder —Star Cutter Company

Star Cutter Company has announced enhancements to its Star NXT 5-axis Tool Grinder, a versatile 5-axis CNC machine with a small footprint and a large grind zone.

Mechanical improvements to the NXT design provide higher system rigidity and improved contamination containment, as well as wash down bed and coolant boost pump upgrade



options. The machine's control software now features the latest Flexium Tools with NUMROTO 4.2.0, as well as an innovative solution for freeform grinding using ESPRIT CAD/CAM capability with 3D simulation and special capability for medical components.

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accommodates denser pallet arrays for improved lot sizes and runtime, while delivering smoother robot operation and better repeatability. Additionally, the system can now adapt to multiple part profiles to be produced within a single run. An optional laser marking system has also been integrated for automated tool marking, in addition to other new features.

Standard and custom options for process enhancement are available, including a new clearance-optimized flip-up and air-actuated tailstock and new workholding solutions.

The NXT 5-axis tool grinder has a 6.5' W by 7.5' L footprint with a 30.2" x 19.9" x 25.6" (LWH) grinding zone and ability to run tools up to 10" in diameter. Backed by application support, the Star Cutter NXT grinders are designed, manufactured and serviced in the United States.



New FANUC EDM Models —Methods Machine Tools

Methods Machine Tools Inc., recently added the FANUC RoboCut α -CiC series to its line of wire electrical discharge machining (EDM) products.

"The α -CiC series continues to push the boundaries of speed, precision, and reliability," said Steve Raucci, Methods' technical sales director and RoboCut product manager. "The redesigned α -CiC series creates a faster, more exact EDM experience."

This generation of the RoboCut

is designed for ultimate rigidity. The EDM machines minimize the amount of distortion embedded into each part, according to Methods. New discharge devices, powered by the SF3 power supply, are designed to improve surface roughening capabilities while maintaining high cutting speeds.

According to Methods, additional features include a taper adjustment function for high-precision taper cutting, thermal displacement compensation for increased stability and faster cycle times thanks to the automatic wire feeding system, AWF3, and core stitch technology.

Currently available in two sizes, the RoboCut α -C400iC has travel lengths of 15.748" on the X-axis, 11.811" on the Y-axis and 10.039" on the Z-axis. Travel on the α -C600iC is 23.622" x 15.748" and 12.204" on the X-, Y- and Z-axis, respectively.

The new models will replace their

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New Products

respective counterparts in the α -CiB series. The C800iB, which belongs to the previous generation of RoboCut, the α -CiB, is still a part of Methods' product offering.

New High-Functioning, Swiss-Type Lathe For Large-Diameter Machining —Star CNC

With a focus on expanding machining capabilities and maximizing productivity, Star CNC introduces their compact SX-38 Type B, 12-axis machine with slantbed construction. The capability to keep eighty tools resident with high Hp motors means heavy metal removal and flexibility.



B-axis surfacing handles up to 1/2" diameter tooling. Star CNC's HFT software manages chip control in difficult to machine materials.

Proprietary software enables remote monitoring and operator intervention predictability. High-functioning with both gang-type and turret type tool posts, the SX-38 serves the precision

machining requirements demanded by the medical, automotive and aviation industries.

Wohlhaupter Boring Tools Offered with Digital Read-out —Allied Machine

Allied Machine and Engineering announces the expansion of Wohlhaupter digital tools offered with an external 3ETECH digital display for micro-precision adjustment.

3ETECH combines precision adjustment measurement in the tool with an external, dockable and detachable digital display that shows the adjustment setting. This user-friendly, micro-

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New Products



precision readout capability facilitates reliable machining processes for high-precision components. A sensor unit fitted to the display makes direct contact with the tool to record the adjustment travel. Wired, Bluetooth or magnetic connections are not required.

The 538052 (537052) precision boring cartridge is equipped with 3ETECH. Made of hardened steel, it

is extremely robust and resistant to all external mechanical influences. It can be used on serrated tool bodies and Alu-Line slide tools in the diameter range from 3.937" – 128.15". Additionally, this precision boring tool can be adjusted without the aid of the readout. Its diameter can be set via a vernier scale in 0.0001" increments.

The 3ETECH display unit docks onto the tool and is activated via a pushbutton. It then shows the relative adjustment value of the tool in 0.0001" increments of the diameter to enable high-precision boring. Because the readout attaches externally and is not built-in, it can be used with all Wohlhaupter tools that are equipped with

3ETECH sensor units. The external display is particularly suitable for tools having a small body diameter and for special tools with one or more adjustment units.

3ETECH provides the capability to store measured values in the tool itself to prevent data loss. The patent-pending interface between the digital readout and the tool ensures safe detachment in the event of an unintentional spindle start and protects the operator if the display is inadvertently left on the tool.

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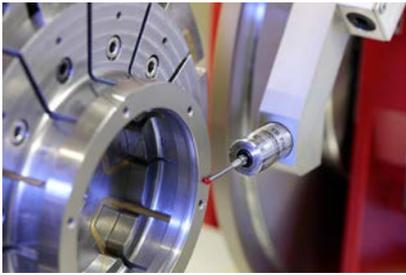
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New Products



New High-Precision Touch Probe —HEIDENHAIN

HEIDENHAIN's new TS 750 high-precision touch probe is now available for in-process workpiece measurement in grinding machines

and lathes. This extremely durable new probe offers the ability to state the reproducibility of its jobs at increased probing speeds better than its competitors. And the low probing force inherent in the new TS 750 is an important benefit when working with soft or delicate workpieces.

The TS 750 operates with high-precision pressure sensors, with force analysis for generating the trigger pulse. The forces that arise during probing are processed electronically. This method delivers extremely homogeneous, 360° probing accuracy. It offers high probing speed of up to 1 m/min and does not require a minimum speed.

Also, due to its very low probing forces of approximately 1.5 N (axial) and 0.2 N (radial), the TS 750 can attain high probing accuracy ($\pm 1 \mu\text{m}$) and repeatability with almost no effect on the measured object. Only on further deflection do the forces of the springs take effect until the machine stops.

Delivering reliable measurements after prolonged use -even after five million probing cycles- HEIDENHAIN reports this TS 750 touch probe is still highly accurate: with a probing repeatability of down to $2 \sigma \leq 0.25 \mu\text{m}$ at its high probing speed.

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The Bedway is crafted from a rugged alloy tool steel that has been heat treated and ground to resist distortion for long lasting accuracy. Additionally, the Turcite coated bearing surface has been enlarged so the carriage covers the entire width of the bedway.

New Products



Next-Generation EDM Added to Product Line —Methods Machine Tools

Methods Machine Tools, Inc. recently added the FANUC RoboCut

a-CiC series to its line of wire electrical discharge machining (EDM) products.

“The a-CiC series continues to push the boundaries of speed, precision and reliability,” said Steve Raucci, Methods’ technical sales director and RoboCut product manager. “The re-designed a-CiC series creates a faster, more exact EDM experience.”

“The next generation of the RoboCut features innovative technology, making it the most productive wire EDM machine on the market,” said a company spokesperson. “Constructed for high rigidity, the advanced EDM machines minimize the amount of distortion embedded into each part. New discharge devices, powered by the SF3

power supply, improve surface roughening capabilities while maintaining high cutting speeds.”

Additional features include a taper adjustment function for high-precision taper cutting, thermal displacement compensation for increased stability, and faster cycle times due to the automatic wire feeding system, AWF3, and core stitch technology. Currently available in two sizes, the RoboCut a-C400iC has travel lengths of 15.748” on the X-axis, 11.811” on the Y-axis and 10.039” on the Z-axis.

Travels on the a-C600iC are 23.622” , 15.748” and 12.204” on the X-, Y- and Z-axis.

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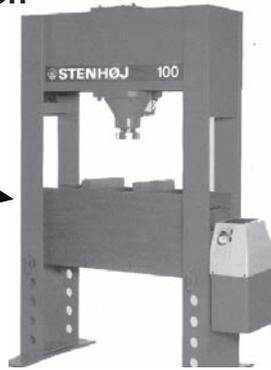
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New Products

respective counterparts in the a-CiB series. The C800iB, which belongs to the previous generation of RoboCut, the a-CiB, is still a part of Methods' product offering.

Solid Carbide Micro Drill with Through Coolant Capability

—Walter

Walter offers the Supreme DB133 solid carbide micro drill with internal and external coolant capabilities.

“The use of Walter grades WJ30EL and WJ30ER, specifically for micro drills, ensures that the drills exhibit enhanced wear resistance. The cutting edge geometry increases process reliability and optimized dimensions allow

for maximum stability, even with the smallest drills. The uniform finish on the drill cutting edges and tight tolerances ensure that the surface finish of the drilled holes is excellent,” said a company spokesperson.

With the special flute geometry, the chips (swarf) are evacuated effectively. This means that hole depths of up to 12 x Dc can be achieved.

Oil or emulsion can both be used as a coolant with these drills. For deeper holes beyond 8 x Dc, Walter offers a corresponding line of pilot micro drills, the DB131.

The DB133 drills, with their 140° point geometry, are available in diameter range from 1/32” to 5/64”. Length to diameter ratios (L/D) of 5, 8 and 12 x Dc are standard.

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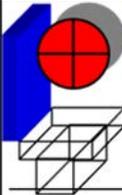


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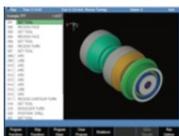
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to recognize hole geometry—including intersecting and non-conventional holes—in solid bodies with no history. Once Mastercam discovers these holes, you can use expanded options to save your custom holes to a template for future use. Users can use Mastercam's Add History function to detect complex holes in solid bodies. Simply select Hole operations to find all holes within the range of minimum and maximum radius values that are entered.

Modifying geometry by dragging your mouse is now available for Trim to Entities, Fillet Entities, and Chamfer Entities functions.

Mastercam makes it easier to create text for notes and labels by adding many of the capabilities of the Create Letters function into the Note function. Note's redesigned function panel gives users improved usability, more options, and increased control.

Other Mastercam Design Improvements include: Two new flowline functions, Edit UV and Reflow UV, that can be used to analyze and modify the UV direction on surface models to more effectively utilize the flowline milling toolpaths. The ability to mirror geometry about both the X and Y axes in one operation. Draw a window to select multiple faces when you want to change the color of a set of solid faces and much more

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...Hotline Continued From Page 8

El Segundo Based Phase Four Raises \$26 Million

El Segundo-based aerospace startup Phase Four Inc. has raised \$26 million in Series B funding to support development and mass production of its propulsion engines for satellites, the company announced June 11.

The round was led by New York-based venture capital firm New Science Ventures. Since the first satellites using Phase Four's Maxwell engines launched in January, the company has gained commercial and government contracts, including a \$750,000 contract with the U.S. Air Force.

Space News reported that the company plans to triple the production of its Maxwell engines between now and the first half of 2022 using the funding. Phase Four chief executive Beau Jarvis said in a statement that the funding round will also accelerate development of other Maxwell engines, such as an iodine-fueled variant.

Founded in 2015, Phase Four uses "plasma thruster technology" to create lighter, more cost-effective satellite engines. The company said its engines bring a 75% reduction in lead time, or the time between when an order is placed and when the customer receives a product, according to the company's website.

Rocket Lab Wins Design Contract for Mars Mission

Two spacecraft designed by Long Beach-based space systems company Rocket Lab USA Inc. may end up orbiting Mars as part of a NASA mission slated for 2024.

The company announced June 15 that it was awarded a design subcontract by UC Berkeley's Space Sciences Laboratory for the Escape and Plasma Acceleration and Dynamics Explorers mission under NASA's Small Innovative Missions for Planetary Exploration program.

Terms of the deal were not disclosed, but a company spokesperson said the dollar value of the contract was in the "tens of millions."

Blue and Gold, the name of the two Photon spacecraft that will be developed by Rocket Lab, would rideshare aboard a commercial launch vehicle contracted by NASA. The goal of the mission is to study how Mars' climate has changed over time.

The company's plans will be subject to a

preliminary design review in June, followed by a confirmation review in July, before the company actually builds the spacecraft.

Founded in 2006, Rocket Lab is on the verge of going public in a SPAC deal with technology investor Vector Capital-backed Vector Acquisition Corp. The deal, which values the company at \$4.1 billion, is expected to close at the end of the second quarter.

Rocket Lab has sent more than 100 satellites to orbit for government and commercial use since its first launch in 2018 and has raised \$290 million in funding to date.

Boeing Secures \$169M For 12 Apache Helicopters in AZ.

Boeing has received a \$169.46 million contract from the U.S. Army to support a long lead effort for the full-rate production of lot 12 Apache attack helicopters.

Services will take place at the company's facility in Meza, Arizona, and the estimated completion date is May 31, 2027, the Department of Defense said in late June.



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