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**Senga Engineering Mission**

Senga Engineering is committed to supplying precision machined components that fully satisfy our customers' requirements. We position ourselves to achieve profitable growth by fostering an environment focused on continually improving the effectiveness of our Quality Management System and improving employee skills.

**CNC Vertical Mills**

# of Axis	Manufacturing	Model	# of machines	Year	X Travel (Inches)	Y Travel (Inches)	Z Travel (Inches)	Accuracy (micrometers)	Table Size	Spindle Speed	Live or Manual tool change?	High pressure coolant thru the tool?	Rotary Table or Indexer?	Multi Pallet Changer?
5-Axis Direct Drive Motor	DMG MORI	DMU 75 monoBLOCK	2	2019	28.9"	25.6"	22"				Live Tooling - 80 tools	Yes	Rotary	No
5-Axis Direct Drive Motor	DMG MORI	DMU 65 monoBLOCK	1	2018	28.9"	25.6"	22"				Live Tooling - 110 tools	Yes	Rotary	No
5-Axis Direct Drive Motor	MORI SEIKI	NMV 5000 DCG	1	2007	28.7"	20.1"	20.1"	2.0 micron	Ø 27.6"	12,000 rpm	Live Tooling - 61 tools	Yes	Rotary	No
4-Axis	MORI SEIKI	DURAVERTICAL 5100	3	2011, 2011, & 2014	53.1"	23.6"	20.9"	1.76 micron	40" by 20"	10,000 rpm	Live Tooling - 30 tools	Yes	Indexer	No
4-Axis with contouring capability	MORI SEIKI	SV-500	1	1998	31.5"	20.1"	20.1"	5.0 micron	43.3" by 23.6"	20,000 rpm	Live Tooling - 30 tools	Yes		No
4-axis	OKUMA	MB-46VAE-R	1	2006	32"	18.11"	18.11"	5.0 micron	29.92" by 18.11"	15,000 rpm	Live Tooling - 32 tools	Yes		No
4-axis	KIRA	KPC30A	1	2002	19.7"	15"	11.8"	5.0 micron	25.6" by 15.0"	15,000 rpm	Live Tooling - 14 tools	Yes		No
3-axis with rotary table	KIRA	VTC30Elite	2	1998, 1998	17.34"	11.42"	10.63"	5.0 micron	19.68" by 12.6"	10,000 rpm	Live Tooling - 10 tools	Yes		No
3-axis with rotary table	KIRA	VTC30A	2	2000, 2000	15.75"	11.81"	10.63"	5.0 micron	12.5" by 19.5"	10,000 rpm	Live Tooling - 10 tools	Yes		No

## CNC Horizontal Mills

Manufacturer	Model	# of machines	Year	# of Axis	X Travel (Inches)	Y Travel (Inches)	Z Travel (Inches)	Accuracy (micro- meters)	Table Size	Spindle Speed	Live or Manual tool change?	High pressure coolant thru the tool?	Rotary Table or Indexer?	Multi Pallet Changer?
DMG MORI SEIKI	NHX5000	1	2016	4 Axis with Contouring Capability	28.74"	28.74"	34.60"	1.8 micron	Ø 31.4" Height: 39.4"	15,000 rpm	Live Tooling - 160 tools	Yes	Rotary - Linear Pallet Pool	Yes
MORI SEIKI	NH-4000 DCG	2	2011, 11	4 Axis with Contouring Capability	24.8"	22"	22"	1.8 micron	Ø24.8" Height: 35.4"	14,000 rpm	Live Tooling - 240 tools	Yes	Rotary - Linear Pallet Pool	Yes
MORI SEIKI	NH-4000 DCG	1	2007	4 Axis with Contouring Capability	24.8"	22"	22"	1.8 micron	Ø24.8" Height: 35.4"	14,000 rpm	Live Tooling - 40 tools	Yes	Rotary - Carrier Pallet Pool	Yes
MORI SEIKI	NHX5000 2nd Generation	1	2015	4 Axis with Contouring Capability	28.74"	28.74"	34.60"	2.54 micron	Ø31.4" Height: 39.4"	15,000 rpm	Live Tooling - 240 tools	Yes	Rotary	Yes

## CNC Lathes

# of Axis	Manufacturer	Model	# of machines	Year	X Travel (Inches)	Y Travel (Inches)	Z Travel (Inches)	Accuracy (micrometers)	Chuck Size	Spindle Speed	Live or Manual tool change?	High pressure coolant thru the tool?
11 - axis	OKUMA	MULTUS-U-3000	1	2016	32.08"	9.84"	62.99"	10 microns	8"	5,000 rpm	Live Tooling - 80 tools - Both Turrets	Yes
10 - axis	OKUMA	LT2000EX	3	2011, 2017	8.07"	3.74"	28.74"	10 microns	8.27"	6,000 rpm	Live Tooling - 32 tools - Both Turrets	Yes
9 - axis	OKUMA	LT200-MY	1	2007	7.56"	3.62"	27.56"	3 microns	8"	6,000 rpm	Live Tooling - 24 tools - Both Turrets	Yes
5 - axis	OKUMA	LU300-M	5	2003, 04, 05, 07, & 08	14.9"	14.9"	23.7"	3 microns	8"	4,500 rpm	Live Tooling - 24 tools - Both Turrets	Yes
5 - axis	OKUMA	LU15-M	2	2001, 2000	11.61"	11.61"	49.41"	3 microns	10"	4,500 rpm	Live Tooling - 20 tools - Both Turrets	Yes
3 - axis	OKUMA	LB10II-M	2	1998	6.69"	6.69"	11.81"	3 microns	8"	6,000 rpm	Live Tooling - 12 tools - Single Turret	Yes
9 - axis	OKUMA	LU3000EX	1	2013	16.53"	13.38"	51.18"	3 microns	10"	5,000 rpm	Live Tooling - 20 tools - Both Turrets	Yes
4 - axis	OKUMA	LB3000EX	2	2012, 2013	13.39"	13.39"	39.38"	3 microns	10"	4,200 rpm	Live Tooling - 12 tools - Single Turret	Yes
4 - axis	OKUMA	LB3000EXII	2	2013, 2016	39.37"	16.14"	22.24"	3 microns	10"	5,000 rpm	Live Tooling - 20 tools - Both Turrets	Yes
4 - axis	OKUMA	LU15	2	1999, 2000	15.75"	n/a	49.4"	3 microns	10"	4,500 rpm	Live Tooling - 20 tools - Both Turrets	Yes
4 - axis	OKUMA	LU25	1	1998	19.49"	n/a	54.52"	3 microns	10"	3,500 rpm	Live Tooling - 22 tools - Both Turrets	Yes

## Additive Manufacturing (3D Printers)

Manufacturer	Model	# of machines	Year	X Travel (Inches)	Y Travel (Inches)	Z Travel (Inches)	Resolution (Inch)	Dissolvable Supports	Plastics Capable	ULTEM	AS9100 Certified Materials & Certifications	Carbon Fiber
Stratasys	Fortus 450mc	1	2018	16"	14"	14"	0.005" to 0.016"	YES	YES	YES	YES - but only on request	YES

## Inspection Equipment

Inspection Equipment						
	Manufacturer (insert additional rows as needed)	Model	# of machines	Year	# of Axis	Software
Bridge CMM	Hexagon MI	Brown & Sharpe 5.7.5	1	2005	3-axis	PC-DMIS 2019
Bridge CMM with Analog Scanner	Hexagon MI	Brown & Sharpe 7.10.7	1	2012	3-axis	PC-DMIS 2019
Bridge CMM	Hexagon MI	Brown & Sharpe Shop Floor 4.5.4	1	2012	3-axis	PC-DMIS 2019
Bridge CMM	Hexagon MI	Brown & Sharpe Shop Floor 4.5.4	1	2013	3-axis	PC-DMIS 2019
Bridge CMM	Hexagon MI	Hexagon Shop Floor 7.10.7	1	2015	3-axis	PC-DMIS 2019
Bridge CMM	Hexagon MI	Hexagon Shop Floor 4.5.4	1	2014	3-axis	PC-DMIS 2019
Bridge CMM	Hexagon MI	Hexagon Shop Floor 4.5.4	1	2017	3-axis	PC-DMIS 2019
Bridge CMM with Analog Scanner	Hexagon MI	Hexagon Global S Advantage 9' by 12' by 8'	1	2019	3-axis	PC-DMIS 2019
Visual CMM	Smart Scope	250 ZIP	1	2003	3-axis	Measure Mind 3D MultiSens or
Digital Profilometer	Mitutoyo	SJ-400	1	2012	2-axis	n/a
Digital Profilometer	Mitutoyo	SJ-410	1	2017	2-axis	n/a
OGP Focus Comparator	GP Inc. Optical Gaging Products	FC200	3	2007, 2007, & 2008	2-axis	n/a
Granite Table	Standridge	5ft by 10 ft	1	n/a	n/a	n/a
Keyence	Keyence	IM-3070T	1	2018	2	IM-Editor

## Other Equipment

Manufacturer (insert additional rows as needed)	Model	# of machines	Year	# of Axis	Capacity
Hydmech	Hyd-Mech H14A Automatic Horizontal BandSaw	1	2017	2-axis	14" by 14"
United Surface Solutions	CPC-400 Centrifugal Barrel Finishing System	1	2012	n/a	n/a
United Surface Solutions	ARS-1000 Water Recycling Unit	1	2012	n/a	n/a
Crest Ultrasonics	UltraSonic Washer	1	2007	n/a	n/a