



EQUIPMENT LIST

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CNC VERTICAL MACHINING CENTERS

6 Haas Vertical Machining Center VF10/50

X – 120", Y – 32", Z – 30" travel
30 HP drive motor; high performance vector drive spindles; high torque brushless servos on all axes and standard spindle speeds of 7,500 rpm; torque ratings of 450 ft. lbs.

1 Haas Vertical Machining Center VF-6/50

X-64", Y-32", Z-30" travel, 50 taper cartridge spindle. Produces 450 ft. lb. of torque. 500-7500 rpm ± 120° Tilt /360° rotation.

3 Haas Vertical Machining Center VF-5/50

X-50", Y-26", Z-25" travel, 50 taper cartridge spindle powered by 30 hp dual drive (Y-Delta) motor. Produces 450 ft. lb. of torque. 500-7500 rpm

1 Haas VM-3 Vertical Mold Machine

40" x 26" x 25", 40 taper, 5 axis, 12,000 RPM, TR210 Rotary and indexer with an intuitive probing system

1 Haas Vertical Machining Center VF-2

X-30" x Y-16" x Z-20" travel; 40 Taper, 20 HP Vector Drive 7500 rpm 20 station tool changer; 4th axis wired; wireless intuitive probing system

1 Bostomatic Model #312 (4800 MAX RPM'S)

3 Axis CNC Contouring, 4th Axis Rotary Table (A or B Axis)
12" Longitudinal Travel, 12" Saddle Travel, 12" Vertical Travel,
12" x 38" Table

CNC HORIZONTAL MACHINING CENTERS:

2 EC1600ZT Haas Horizontal Machining Center

64" x 50" x 40" (1626 x 1270 x 1016 mm), 50-taper geared-head, 30 hp (22.4 kW) vector drive, 7500 rpm, 30+1 side-mount tool changer; includes 1 MB program memory, 15" color LCD monitor, USB port, memory lock keyswitch, rigid. A 4AXBL_EC-1600ZT 1 allows the use of a fully integrated 4th-axis Haas rotary table or indexer for multi-sided machining. VQC_EC-1600ZT 1 Haas Visual Quick Code is a template-driven conversational programming system that makes creating simple G-code programs nearly effortless.

1 Haas Horizontal Boring Mill HS6R – 50 Taper HMC

4 Axis CNC contouring with touch probe capability. 84" Longitudinal travel X, 50" Vertical travel x 60" Cross travel with build in 4th axis rotary table 37" Dia. 30 HP, 5000 RPM Spindle, 38 Position Tool Changer, 10,000lb table capacity.

1 Haas EC-1600 50 Taper HMC

4-Axis CNC Contouring with Touch Probe Capability,
64" Longitudinal Travel, 40" Vertical Travel, 32" Cross Travel, 30" Rotary Table, 30-HP 6000 RPM Spindle, 30 position Tool Changer, 10,000 lb. table capacity with optional machining enclosure

1 Haas EC-2000 50 Taper HMC

4-Axis CNC Contouring with Touch Probe Capability,
84" Longitudinal Travel, 40" Vertical Travel, 32" Cross Travel, 30-HP 6000 RPM Spindle, 30 position Tool Changer, 10,000 lb. table capacity

1 Kearney & Trecker 5-Axis Moduline(2400 MAX RPM'S)

Horizontal Spindle Traveling Column Machine

72" Longitudinal Travel, 60" Vertical Travel, 30" Cross Travel, A-Axis Table Tilt 90 degree, B-Axis Table Rotation 360 degrees, (2) 40" x 40" Shuttle Pallet System equipped with K&T Gemini - D CNC Control, 89 Pos. TC

2 Kearney & Trecker Orion 2200 (5000 MAX RPM'S)

4 Axis CNC Contouring with Touch Probe Capability
40" Longitudinal Travel, 36" Vertical Travel, 30" Cross Travel, 24" Square Table Pallets with 2 Pallet Shuttle System, 360,000 Position Rotary Milling Capability. Equipped with K&T Gemini-D CNC Control

1 Kearney & Trecker Milwaukee Matic #180 (4000 MAX RPM'S)

3 Axis CNC Contouring, 20" Longitudinal Travel, 20" Vertical Travel, 20" Cross Travel, 16" Square Table Pallets with 2 Pallet Shuttle System, Equipped with K&T Gemini-D CNC-Control, 360 Degree Index Table with 11 Increments

1 WOTAN (1600 MAX RPM'S)

4 Axis CNC Contouring, 72" Longitudinal Travel, 64" Vertical Travel, 60" Cross Travel, 22" Spindle Travel
44" x 54" Table, Equipped with G.E. 1050 Mark Century CNC Control

1 Giddings & Lewis Model 70-H5-T (1020 MAX RPM'S)

3 Axis CNC Contouring, 96" Longitudinal Travel
48" Vertical Travel, 48" Cross Travel, 36" Spindle Travel
48" x 96" Table (with Airlift Rotary), Equipped with Fanuc 11MA CNC Control

2 Pratt & Whitney Vikings (3600 MAX RPM'S)

3 Axis CNC Contouring, 4th Axis Rotary Table (A or B Axis)
96" Longitudinal Travel, 60" Vertical Travel, 20" Cross Travel,
40" x 100" Table

CNC LATHES

1 Fryer CNC Lathe – Easy Turn-50 w/Big Bore

X-27", Z-127", 50" swing, 35" Over cross slide, A2-20 spindle
55hp, 500 rpm, 3 speed gearbox, max torque 19,700 ft/lbs
Max part weight with tailstock & steady rest is 20,000 lbs.

1 Haas CNC Lathe SL30

14.5" x 34" max, 30" swing, 30-hp, 50-3, 400 rpm, A2-6 spindle and 10" chuck 2 speed High-torque Gearbox

1 Haas CNC Lathe ST40
2.5" x 44" (max), 34.5" swing, 40-hp Vector Drive, 240 rpm,
2-speed gearbox, A2-8 spindle and 15" chuck

1 HAAS ST-30Y

Y Axis; 18"x23" max capacity, 3" bar, 31.75" swing, 30 hp vector drive
3400 rpm, A2-6 spindle 10" chuck, 12-station hybrid turret, high-torque
live tooling w/C axis, memory lock keyswitch, spindle orientation

2 Cincinnati Milacron Cintum CNC 2 Axis (2240 MAX RPM'S)

18" Swing, 100" Between Center

1 Mori Seiki Model S1-5H-CNC (3000 MAX RPM'S)

24" Swing Over Bed, 21" Swing Over Carriage
13" Swing Over Crossslide, 43" Between Centers

PRECISION HORIZONTAL BORING MILLS:

1 DeVlieg Spiramatic Jig Mill - Model 4K60 (1450 MAX RPM'S)

60" Horizontal Travel, 48" Vertical Travel, 20" Spindle Travel
36" x 72" Table (with Anilam autopositioning system and digital readout)

1 El Dorado Universal Gundrill (5860 MAX RPM'S)

25" Max. Depth, .078" to .750" Diameter Hole Capacity

PRECISION JIG BORE

1 Pratt & Whitney Jig Bore - Model 2A (1800 MAX RPM'S)

24" Vertical Travel, 22" x 44" Table

CONVENTIONAL VERTICAL MILLS

6 Bridgeports - Model BR-J Series I (4200 MAX RPM'S)

60" Vertical Travel, 9" x 42" Table
(2) Machines equipped with Anilam Digital Readouts

CONVENTIONAL HORIZONTAL MILL

1 Cincinnati Duplex Hypowermatic Milling Machine
22-900 RPM's; 140" X Travel

CONVENTIONAL LATHES

1 LeBlond #4 Gun Boring/Deep Hole Drilling & Boring
Work Piece Capacity: 10" ID, 12 3/4" OD, 12 Ft. Length

1 Chausing Colchester

15" Swing Over Bed, 54" Between Centers

1 LeBlond

15" Swing Over Bed, 54" Between Centers

1 LeBlond

19" Swing Over Bed, 72" Between Center

1 American Pacemaker

27" Swing Over Bed, 16" Swing Over Saddle
168" Between Centers, Equipped with Mimik Tracer

1 Hardings Model HLV

10 7/8" Swing Over Bed, 6 3/8" Swing Over Saddle, 21" between centers

ELECTRICAL DISCHARGE MACHINES (EDM)

7 PDS Custom Made

68" Max. Ram Stroke, Equipped with Elox Astra 400D
Power Supply, Equipped with EDM-12 Digital
Readout Display with Program Stop
38" x 36" x 90" Work Piece Size

2 Elox - Model HRP-109

12" Max. RAM Stroke, Equipped with Elox Astra
400D Power Supply, 56" x 32" x 28" Work Piece Size

GRINDING MACHINES

1 Gardner Hydrabrasive Surface Grinder, 18" Vertical Travel, 12" x 30"
Table Travel (3500 MAX RPM'S)

2 Boyar Schultz Surface Grinders, 12" Vertical Travel, 6" x 18" Table Travel
(3450 MAX RPM'S)

2 Senaca R.O. Universal Cutter Grinders, Equipped with Optical Comparator
(3450 MAX RPM'S)

1 Heald Size-Matic Internal Cylindrical Grinder, Inside Diameter Grinding,
Capabilities up to the Max. Workpiece Diameter 9 3/4" at 3" Max. Depth
(25K MAX RPM'S)

1 Brown & Sharpe Universal Cylindrical Grinder, 12" Swing, 24" between
centers (24 K . 2250 MAX RPM'S)

1 Brown & Sharpe Universal Cylindrical Grinder, 16" Swing, 30" between
centers (1800 MAX RPM'S)

1 Studer Cylindrical Grinder, 10" Diameter Swing, 16" between centers
(25K / 2250 MAX RPM'S)

1 Parker Majestic Surface Grinder (3600 MAX RPM'S)

1 Cincinnati Monoset Cutter Grinder (8000 MAX RPM'S)

1 Bryant Center Hole Grinding Machine (45000 MAX RPM'S)

2 Taft Pierce Model 1 Surface Grinder (3600 MAX RPM'S)

1 H. T. Schudin OD Grinder (1200 MAX RPM'S)

1 ANCA Fastgrind CNC

FINISHING EQUIPMENT AND DEBURRING EQUIPMENT

Ultrasonic Cleaning Machines, Vibratory Deburring Machine, 7.5 Cu. Ft. Capacity, SS White Airbrasive Jet Machining Unit Model D, Extrude Hone Machines - Deburring Process

MICROSCOPIC CRITICAL DEBURRING

- 3 Zeiss Surgical Microscope, Opmi I on Table Stand with Magnification of 6.2X, 10.0X, 16.0X, 26.0X and 40.0X
- 2 Baush & Lomb Sterozoom Microscope on Table Stand with Magnification of 2.5X to 140X
- 1 Baush & Lomb Sterozoom Microscope on Table Stand with Magnification of 7X to 30X

MISCELLANEOUS EQUIPMENT

- 1 DoAll Model 1213A Horizontal Bandsaw
- 1 Amada Vertical Bandsaw Model VM-1200, 19.7" x 19.7 x 47.2" Cutting Capacity
- 1 Lincoln Welder, Ideal Arc DC-1000-TIG 300/300 AC/DC
- 1 Air Products Welder, Model THRF 300 RJ
- 2 Miller Welders, Syncrowave 300
- 1 Miller Welder, Model 330A/BP
- 1 McKay Welder, Model AW-GE Automatic Welding Machine Crane Capacity 3 Ton

INSPECTION EQUIPMENT

- 1 FARO Laser Tracker ION high accuracy, 3 dimensional coordinate measuring device. Measurement range of up to 180'. 2 rotary angular encoders and laser based distance measurement system to track and measure position of a Retro reflector target.
- 1 CMM-LK Evolution Model 25.12.10
Measuring range of 100" -X axis, 48" - Y axis & 40 Z axis
Volumetric accuracy of .00024
- 1 CMM-LK Evolution Model 25.12.10 with SP25 Scanning Head
Measuring range of 100" -X axis, 48" - Y axis & 40 Z axis
Volumetric accuracy of .00024
- 1 Jones & Lamson Optical Comparator, Model #Epic 230, Magnification to 100X, 30" Screen, equipped with Digital readouts and Automatic Print-out Systems.
- 3 PDS Design Camber Tracking Devices, used for tracking Restricted Access Channels, equipped with Digital Readouts and Automatic Print-out Systems.

- 1 Veeco Leak Detector - Model #MS-31D
Sensitivity: 6 x 10⁻¹¹ atm c4 Sec. for air at full pump speed
Leak Range: 10 atm cc/sec. To 6 x 10⁻¹¹ atm cc/sec. for air
- 10 Granite Inspection Surface Plates - Lab Grade - ranging in size from 36" x 96" to 48" x 192"
- 8 Granite Inspection Surface Plates, ranging in size from 36" x 36" to 36" x 72"
- 5 Micro-Hite Electronic Height Set, 0" to 24", Equipped with Digital Readout and Automatic Print-out Systems
- 1 Pratt & Whitney Supermic Micrometer, Model B, Measurements to within .00002.
- 1 Versitron Rockwell Hardness Testing System, equipped with Digital Readout and Automatic Print-out Systems.
- 1 Tukon Microhardness Tester
- 1 Jones and Lamson Optical Comparator, 36", With digital readout

Non-destructive testing facility for dye penetrant inspections and fluorescent penetrant inspections.

Note: All inspection and test equipment are calibrated and traceable to the National Institute of Standards & Technology.

CAD/CAM SYSTEMS

Solid Works System (Latest Revisions)
SMARTCAM CAM System (Latest Revisions)

PDS PARTS CAPACITY

A)	<u>LARGEST PARTS</u> <u>CAPACITY</u>	<u>WORK PIECE SIZE</u>	<u>SMALLEST PARTS</u> <u>CAPACITY</u>	<u>WORK PIECE SIZE</u>
	<u>LATHES</u>	27" OD X 168" Long	<u>LATHES</u>	2" Dia. X 12" Long
	<u>MILLS</u>		<u>MILL - VERTICAL</u>	2" x 2" x 2"
	3 Axis CNC	96" Lg. x 60" High x 36" Wide	<u>MILL- HORIZONTAL</u>	6" X 6" x 6"
	4 Axis CNC	72" Lg. x 64" High x 44" Wide		
	5 Axis CNC	72" Lg. x 60" High x 30" Cross travel		
	Haas	120" Lg. X 32" High x 30" Wide		
	<u>GUNBORE & (TREPAN)</u> 1	2 3/4" OD x 10" ID x 144" Lg.		
	<u>BROACH</u>		<u>BROACH</u>	
	10 Ton Cylinder w/60" Stroke	72" Dia. X 10" Lg. (10" Dia. Hole)	5 Ton Cylinder W/ 36" stroke	2" Dia. X 1" Lg. (1" Dia. Hole)
	<u>EDM</u>	38" x 36" 90" Lg. (Ram Type 68" Stroke)	<u>EDM</u>	2" x 2" x 2"
	<u>GUNDRILL</u>	30" Lg. x 12" High x 30" Wide (.750 Dia. Hole x 25" Lg.)	<u>GUNDRILL</u>	2" Dia. X 1" Lg. (.078" Dia. Hole x 1" Lg.)
	<u>CYLINDRICAL GRINDER</u>	16" Dia. x 30" Lg.	<u>CYLINDRICAL GRINDER</u>	1" Dia. X 3" Lg.
	<u>SURFACE GRINDER</u>	30" Lg. X 18" High x 12" Wide	<u>SURFACE GRINDER</u>	2" Lg. X 2" High x 2" Wide
	<u>CMM</u>	100" Lg. X 48" High x 40" Wide		