



## Equipment List

### MACHINING EQUIPMENT

#### Laser Machines 117

- 62 High Performance 4 axis ND:YAG Laser systems with cutting and welding capabilities
- 5 ND:YAG Laser spot welding systems
- 3 High Performance ND:YAG dedicated tubular cutting systems
- 38 Ultra-High Performance 4 axis ND:YAG tubular cutting systems
- 2 4 axis ND:YAG Fiber Delivered Laser welding system with pulse shaping capabilities
- 1 6 axis ND:YAG Fiber Delivered Laser welding system
- 4 ND:YAG Laser Etcher/Writers
- 2 High Performance 4 axis CO2 Laser cutting systems

#### Electrical Discharge Machines - CNC Wire 16

- 3 LQ Controlled AQ325L with linear drive system
- 1 LN Controlled AQ325L with linear drive system
- 1 LN Controlled 300L with linear drive system
- 1 LN Controlled AQ750L for large work pieces
- 1 OC (automatic wire threading) 5-axis
- 2 OIA (automatic wire threading) 5-axis
- 1 FA20S (automatic wire threading) 5-axis
- 1 FA10 Advance (automatic wire threading) 5-axis
- 1 11A (automatic wire threading) 5-axis
- 1 SP-43 with round guides
- 3 SP-43 with "heat" technology

#### Electrical Discharge Machines – Plunge Type 11

- 1 20-amp power supply and 0.0001" digital readouts with programmable Z-axis with System 3R orbiter
- 3 3-axis 40 amp linear Sinker
- 1 3-axis 80 amp CNC Sinker
- 2 EDM high-speed drill
- 1 3 axis High precision Graphite manufacturing CNC milling center
- 1 4 axis High precision Graphite manufacturing CNC milling center
- 1 Microburnishing system
- 1 ST-10 Lathe

#### Electrochemical Grinding Machines 2

- 1 CNC Electrochemical 3-axis CNC Grinder
- 1 Tube Electrochemical cutoff machine

#### Programming Engineering Capabilities 17

- 3 EDGE CAM 12.5
- 3 PRO-E WILDFIRE V 4.0 with Pro Mfg 5 axis
- 5 SOLIDWORKS 2009
- 1 NC CAD 32
- 1 CAGILA Laser Cam
- 3 MasterCam V. X2
- 1 CamWorks

### CONVENTIONAL MACHINES

#### Manual Turning Equipment 4

- 1 Engine lathe
- 1 Precision secondary lathe
- 1 Tool room lathe grinding equipment
- 1 Tool room TL-1 lathe

#### Grinding Equipment 11

- 2 6" x 12" surface grinders
- 2 12" x 24" EXB wet bed grinders
- 1 12" x 24" DX wet bed
- 2 6" x 18" wet surface grinders
- 4 Smart 8 x 18 CNC grinders

#### Manual Milling Equipment 9

- 4 Milling Machines with digital readouts
- 3 Milling Machines
- 2 Knee Mills

#### Micro Drilling 1

- 1 Sensitive micro drill

#### Saws 3

- 1 Horizontal cut off 15"
- 1 Vertical band saw 16"
- 1 Vertical band saw 12"

### HEAT TREATING & STRESS RELIEVING 2

- 1 FURNACE - 2300 degrees F, maximum upper & lower oven computer controlled
- 1 Vibratory stress relief machine

#### NiTinol Shape Setting 28

- 4 Fluidized bed FB-08
- 1 Fluidized bed Model SBL-1
- 1 Lindberg/Blue Air Convection Furnace
- 1 Upton Salt Bath
- 1 TA Instruments DSC Q10
- 1 Tensile Tester (Testworks software package)
- 1 Tensile Tester (Bluehill software package)
- 2 Thermo brand circulators (temperature controller for tensile testing)
- 1 Heat/chill plate (simple bend-and-free recovery testing)
- 1 "ShapeTrack" bend-free-recovery system
- 1 "Thermosafe" dry ice maker
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- 1 Fluidized bed Model SBL-1
- 1 Lindberg/Blue Air Convection Furnace
- 1 Upton Salt Bath
- 1 TA Instruments DSC Q10
- 1 Tensile Tester (Test-works software package)
- 1 Tensile Tester (Blue Hill software package)
- 2 Thermo brand circulators (temperature controller for tensile testing)



## CNC Milling Equipment 29 (plus 48 tools)

- 5 Vertical machining center 4 axis 20\*16\*20 20 tools
- 1 Vertical machining center 5 axis 20\*16\*20 20 tools
- 1 Vertical machining center 4 axis 20\*14\*18 24 tools
- 2 Vertical machining center 3 axis 20\*14\*18 24 tools
- 1 APC vertical machining center 3 axis 20\*14\*18 24 tools
- 1 Vertical machining center 3 axis 40\*20\*20 40 tools
- 1 Vertical machining center 5 axis 23.5\*15.5\*13.5 25 tools
- 1 Vertical machining center 4 axis 23.5\*15.5\*13.5 25 tools
- 1 Vertical machining center 4 axis 35.5\*21.5\*17.5 25 tools
- 1 Horizontal machining center 4 axis 22\*22\*23.6 60 tools
- 11 Willemin 7 axis Bar feed machining centers 48 tools
- 3 floor mounted jib material handling systems

## Swiss Turning Centers 42

- 23 Swiss Machining Centers 7 axis
- 2 Swiss Machining Center with y 10 axis
- 1 ESCOMATIC™ Coil Feed Cam
- 7 Swiss Machining Centers 9 axis
- 2 R-07 Turning Centers 5 axis
- 1 Mill Turning Center, SL 150 5 axis
- 1 Mill Turning Center, NL 2500 6 axis
- 2 M-20 10 axis machines
- 1 A-16 6 axis machine
- 1 C-16 7 axis machine
- 1 M-12 9 axis machine

## Mass Finishing Equipment 39

- 1 – Blackstone NEY Automated Pickle Passivation system
- 2 – Blackstone automatic dryers
- 1 – Manual Blackstone dryer
- 2 – Microburnishing systems
- 1 – Greco Degreasing system
- 30 – Blackstone cleaning tanks
- 1 – laboratory fume hood
- 1 – floor mounted jib

## CONTROL SYSTEM

- Q.C. system conforms to MIL I-45208A and CALIBRATION system conforms to MIL-STD-45662A
- Our Laser Micromachining Division is registered to ISO 9001:2008 and ISO 13485:2003

- 1 Heat/chill plate simple bend-and-free recovery testing

## ADDITIONAL EQUIPMENT 46

- 1 DAREX TYPE E-90 end mill sharpener
- 3 Cabinet blasters
- 6 Tumble blasters
- 1 Micro blaster
- 1 Tig welder
- 1 Drill sharpener
- 1 Twelve-ton arbor press
- 1 300 amp tig welder
- 2 TOYOTA 3000 lb. electric fork lifts
- 4 High energy, constant velocity finishing/deburring machines
- 4 Vibratory deburrers
- 12 Microburnishers
- 8 Custom Built Electropolishing Systems

## INSPECTION EQUIPMENT 280

- 1 Contura Scanning CNC CMM inspection system
- 2 12 x 12 video inspection system with Pattern Recognition and up to 20 millionths inch accuracy per inch
- 4 Rotary stent video inspection system with Pattern Recognition & up to 20 millionths inch accuracy per inch
- 2 12x12x6 Automated Vision System with Feather touch probe system
- 2 12 x 12 Manual Vision System
- 1 6 x 6 Manual Vision System
- 1 Scanning Electron Microscope (ASF)
- 1 Vertical Comparator
- 2 14" horizontal optical comparators with AUTOCOMP onboard computers
- 4 Automatic video inspection systems
- 32 -16" optical comparators with AUTOCOMP onboard computers
- 14 -12" optical comparators with digital readouts
- 4 Microscopes 10-63 power magnification
- 2 Stereoscopic Microscope with photo graphic capacity apparatus 10-126 power magnification
- 3 Toolmaker microscopes to 500x
- 189 Microscopes 8-50 power magnification with light sources
- 2 Dual head stereoscopes 6-31x power magnification
- 1 Hardness tester
- 2 Surface texture measuring device
- 3 Laser Micrometers
- 4 24" Electronic Height Gages
- 1 TA Instruments Q10 DSC
- 2 Tensile Testers
- 1 24 x 24 Automated Vision System with dual axis rotary, touch probe, and laser scanning