

Manufacturing Equipment List

HYDRAULIC STRETCH FORMING PRESSES

Equipment Type: Sheridan Gray	Size: 34 ft. Between Jaws 50" Die Table Stroke	Capacity: 24" Extrusion 100" Sheet	1100 Ton 600 Ton
Sheridan STC-1500 With Overhead Bulldozer Capability	41 ft. Between Jaws 108" Die Table Stroke	24" Extrusion 144" Sheet	1500 Ton 1500 Ton



HPM 4 Post Press With Offset Jaw Capability	152" x 48" Guerion Box 124" x 180" Sheet	24" Stroke	2500 Ton
AHF Custom Sheet Press	34 ft. Between Jaws	128" Sheet	1600 Ton
AHF Custom Lead Edge Cyril Bath	28 ft. Between Jaws	48" Sheet Jaws	75 Ton
Ercco Stretch Press	72" Jaws		300 Ton
Sheridan Gray L-1000	40 ft. Between Jaws 36" Die Table Stroke	100" Sheet	1000 Ton

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Sheridan Gray T-500	15 ft. Between Jaws 80" Die Table Stroke	154" Sheet	500 Ton
Radial Extrusion Stretch Press Cyril Bath	85" Dia. Table	22 ft. Extrusion	25 Ton
Ercco Stretch Press	48" Jaws		100 Ton
AHF Custom Hydro 4 Post Press	24" x 72" Guerion Box		200 Ton
Hufford A-12 Stretch - Wrap	14" x 24 ft. Extrusion		60 Ton
Hufford A-7 Stretch - Wrap	6" x 23 ft. Extrusion		35 Ton
Hufford A-8 Stretch - Wrap	6" x 18 ft. Extrusion		12 Ton
Hufford A-5 Stretch - Wrap	6" x 20 ft. Extrusion		12 Ton
HPM Double Action Press Hydro Form	36" x 38" Guerion Box		300 Ton
Watson-Stillman Hot Jogging and Hydro Press			575 Ton

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Clearing Hot Joggle Press

100 Ton

PRESS BRAKES & SHEARS

Equipment Type:	Size:	Capacity:
Cincinnati Press Brake With Autoform CNC Control	42 ft. Wide	1250 Ton



Cincinnati Press Brake With NC Control Back Stop	26 ft. Wide	600 Ton
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Lodge & Shipley Press Brake 10 ft. Wide 150 Ton

Chicago Press Brake 10 ft. Wide 100 Ton

Di-Arco Press Brake 8 ft. Wide 100 Ton

Lodge & Shipley Shear 12 ft. Wide 3/16" Steel

Wysong 20 ft. Wide 175 Ton

THERMAL FORMING PRESSES & VACUUM BOXES

Equipment Type:	Size:	Capacity:
5 Bank Hot Press	60" x 48" (Each Bank) 60" x 240" max.	14 Ton Ram 9 Ton Pusher

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Hot Press (503)	25" x 17"	9 Ton
Hot Press (501)	102" x 40"	28 Ton
Helicopter Leading Edge Press	12" x 264"	30psi Bladder
Helicopter Leading Edge Press	12" x 72"	30psi Bladder

Superplastic Forming 100 Ton DAKE Post Press Hydraulic 33" x 54" Temperature to 2000 degrees

Superplastic Forming 200 Ton DAKE Post Press Hydraulic 20" x 31" Temperature to 2000 degrees

Superplastic Forming 75 C frame Hydraulic Press 20" x 31" Temperature to 2000 degrees

Jumbo Press 100 Ton Hydraulic 96" x 144" Temperature to 1500 degrees



Hot Form 200 Ton DAKE Double Action Press – Hydraulic 41" x 72" Temperature to 1500 degrees

Hot Form 150 Ton DAKE Post Press – Hydraulic 52" x 98" Temperature to 1500 degrees

Hot Form Press Piano 50 Ton Hydraulic 41" x 101" Temperature to 1500 degrees

Cincinnati 90 Ton Press Brake 10 ft.

LVD 80 Ton CNC Press Brake 10 ft.

AHF Leading Edge Press (Chinook) 50 Ton

Manufacturing Equipment List

AHF Vacuum Box	32" x 90"	-25" hg
AHF Vacuum Box	30" x 36"	-25" hg
AHF Vacuum Box	54" x 18 ft.	-25" hg
AHF Vacuum Box	84" x 100"	-25" hg

Note: All Hot Presses & Vacuum Boxes maintain temperatures @ 1150 - 1450 degrees F +/- 25 degrees F

WATERJET CUTTING

Equipment Type:	Size:
Ingersol Rand 3 Axis CNC Gantry Waterjet	6 ft. x 10 ft. x 12" Travel
Flow 5 Axis CNC Gantry Waterjet, ATA Certified	6 ft. x 12 ft. x 24" Travel
Flow 2 Axis CNC Gantry Waterjet	4 ft. x 8 ft. x 12" Travel

MACHINING

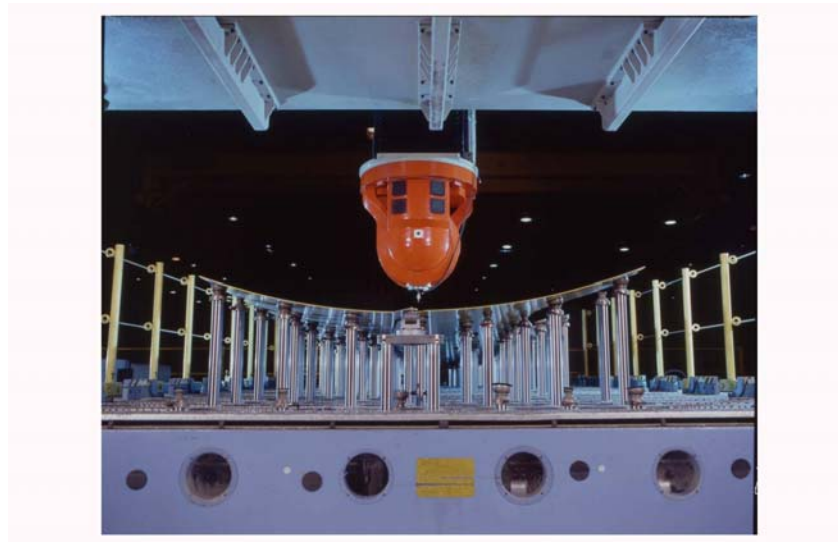
Equipment Type:	Table Size:	Part Size:
Henri Line, 5 Axis Gantry Router Mills (2) With Fanuc 15 MB Control On One Bed	96" X 60 ft.	96" x 60 ft x 54" (One Machine Parked)
SNK 5 Axis Gantry With 3 Spindles Fanuc 9 MB Control (2) On One Bed	160" x 108 ft.	164" x 60 ft. x 28" 164" x 82 ft. x 28" (One Machine Parked)
SNK 5 Axis Gantry With 3 Spindles Fanuc 11 MB Control	160" x 42 ft.	160" x 60 ft. x 34"
Henri Line, 9 Axis, Two Spindle Gantry Macbormill Fanuc 15 MB Control	160" x 50 ft.	104" x 50 ft. x 54"

Manufacturing Equipment List



AHF 2 Spindle, 4 Axis Horizontal Profiler (2) Special Machining Centers	60" x 23 ft.	48" x 22 ft. x 72"
Mori Seiki, 3 Axis Machine Center With Fanuc 18 MC Control	25" x 60"	25" x 60" x 25"
SNK-RB4N, 4 Axis Vertical Mill With Fanuc 9 MB Control	96" x 11 ft.	96" x 11 ft. x 48"
Seaburg, 5 Axis Gantry Router With Fanuc 15 MAMA Control	96" x 48 ft.	96" x 48 ft. x 64"
Fosdick, Fosmatic Radial Drill Machine With 72" Arm	96" x 52"	52" x 96" x 72"
Shoda NC Router, 9 Head Model NC163	5 ft. x 12 ft.	
Torres Router With 140 Station Pogo Table Fanuc 15 MB / Torrestool Controls	138" x 40 ft.	135" x 38 ft. x 59"

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Cincinnati, 4 Axis Swarf Profiler With General Numeric GN6-2 Control	56" x 16 ft.	72" x 16 ft. x 19"
4K-120 DeVlieg Jig Mill with 3 axis CNC		40" x 120" x 60"
Cincinnati, 3 Axis Tracer – Profiler	50" x 14 ft.	164" x 40" x 32"
AHF Open Side, 3 Axis Tracer – Profiler	40" x 14 ft.	142" x 40" x 48"
Rambaudi, 3 Axis Tracer – Profiler	25" x 105"	72" x 25" x 18"
Cincinnati Planer With Hydraulic Rise & Fall	54" x 21 ft.	54" x 21 ft. x 30"
Thermwood Router, Model Cartisan 5 4 axis, 2 spindle, dual gantry dual controller	3 ft. x 24 ft.	
Shoda NC Router 3-axis, 2 spindle ATA Capable Renishaw Inspection Probe	8.5 ft. x 17 ft.	102" x 204" x 20"
SNK RB 2N Gantry 30 HP 24 Tool Vertical Machining Center ATA Certified	6 ft. x 10 ft.	118" x 67" x 55"
SNK RB 2N Gantry 30 HP 24 Tool	6 ft. x 10 ft.	118" x 67" x 55"

Manufacturing Equipment List

Vertical Machining Center
ATA Certified

OOYA RE-5M Gantry 72" x 60" x 48"

15 HP 22 Tool

Vertical Machining Center
Makino MC-100

40" x 32" x 25"

CNC 4 Axis Horizontal
Machining Center
25 HP 30 Tool Pallet Challenger
Makino FNC-125 CNC
Vertical Machining Center
20 HP 30 Tool

81" x 28" x 24"

Makino FNC-128 CNC
Vertical Machining Center
4 Axis 25 HP 30 Tool, ATA Certified

49" x 32" x 28"

Makino FNC-106 CNC
Vertical Machining Center
20 HP 30 Tool

42" x 24" x 22"

Hitachi Seiki VA-40 CNC
Vertical Machining Center
7 1/2 HP 25 Tool

28" x 18" x 16"

Hitachi Seiki VA-45 CNC
Vertical Machining Center
10 HP 30 Tool

28" x 18" x 18"

Hitachi Seiki 5000NE
CNC Turning Center
30 HP 10 Tool

48" Centers

MANUAL MACHINES

Equipment Type:

K & T Horizontal Mill HP 92" Travel

K & T Horizontal Mill #24

Cincinnati #2 Horizontal Mill

Manufacturing Equipment List

Roll In Saw

Sunnen Hone Machine

Bridgeport Mill with Readout

Supermax Vertical Mill

Bridgeport Vertical Mills

Ikeda Radial Drill 4'

CORE MANUFACTURING

Equipment Type:

Size:

SNK numerically controlled 5 axis Honeycomb Core
Milling Machine

60" x 360" x 18"

Cincinnati Milacron numerically controlled
5 axis Honeycomb

84" x 720" x 24"

Thermwood CNC Router, Model 70, 5 Axis rotary spindle

10 ft. x 20 ft.

PLY CUTTING

Equipment Type:

Size:

Gerber DSC 2500 Static Cutter

72" X 36 ft.

Gerber DSC 2500 Static Cutter

72" X 60 ft.

CES Autonest Module

BONDING CAPABILITIES

Manufacturing Equipment List

Clean Rooms: 50,000 sq. ft. humidity and temperature controlled rooms

Laser Projection Ply Positioning System:

Virtek Laser-Edge 2000 projectors, 12 projection heads
4 control computers, with software & licenses
Tool targets and other accessories
Fibersim software

Autoclaves:

"A" 4 ft. x 8 ft. working area
"B" 7 ft. x 32 ft. working area
"C" 8 ft. x 35 ft. working area
"D" 6 ft. x 33 ft. working area
"E" 12 ft. x 29 ft. working area
"F" 12 ft. x 40 ft. working area
"G" 12 ft. x 40 ft. working area

Bonding Ovens:

Equipment Type	Max. Temp.	Size (L x W x H)
Baron Gas (#1726) Autoclave Bonding	450 degrees F	13.6 ft. x 6.5 ft. x 6.5 ft.
Spraytec Gas Oven Autoclave Bonding	450 degrees F	35 ft. x 10 ft. x 8 ft.
Grieve Electric (#1780)	650 degrees F	62" x 39" x 48"

Autoclave Bonding:

METAL BOND PROCESSING

Chromic Acid and Phosphoric Acid Anodize Systems, 4 ft. x 33 ft. x 7 ft.

PAINT AND PAINT PREP

Binks Sheila Paint Booth, dry curtain 20 ft. x 30 ft. x 10 ft.
Circle Engineering Paint Booth, down draft 45 ft. x 35 ft. x 10 ft.

Manufacturing Equipment List

Circle Engineering Paint Booth, down draft	32 ft. x 35 ft. x 10 ft.
Circle Engineering Sanding/Prep Booth, side draft	25 ft. x 35 ft. x 10 ft.

CHEMICAL MILLING TANKS

Aluminum	Tank Size
	8 ft. x 4 ft. x 4 ft. Deep
	25 ft. x 10 ft. x 12 ft. Deep
	55 ft. x 10 ft. x 12 ft. Deep
	10 ft. x 20 ft. x 20 ft. Deep
	30 ft. x 10 ft. x 24 ft. Deep
	30 ft. x 6 ft. x 24 ft. Deep
Titanium	Tank Size
Super Plastic Forming (SPF)	8 ft. Dia. x 9 ft. Deep
	10 ft. x 4 ft. x 4 ft. Deep
	24 ft. x 7 ft. x 7 ft. Deep
	27 ft. x 6-½ ft. x 11 ft. Deep
	27 ft. x 6-½ ft. x 12 ft. Deep
	12 ft. Dia. X 9 ft. Deep
	10 ft. Dia. X 8 ft. Deep
Steel	Tank Size
6 tanks	11 ft. Dia. x 6 ft. Deep

WELDING

Equipment Type:	Size:
Controlled Atmosphere Welding Chamber	20"W x 24"H x 48"L
250 Amp Wire Feed Welders	
300 Amp Wire Feeder Welder	
600 Amp Wire Feed Welders	
Miller 250 Amp Tig Welders	

Manufacturing Equipment List

Lincoln 255 Amp Tig Welders

Arco 100 Amp Tig Welder

Sciaky 125 KVA Spot Welder

ROLLING MACHINES

Equipment Type:	Size:
Farnham	0.160" x 24 ft. Roll
Misc.	¼" x 6 ft. Roll
Misc.	¼" x 8 ft. Roll
Misc.	1/16" x 3 ft. Roll

PROCESSING

Equipment Type:	Tank Size:
Chemical Clean, Descale, and Phosphate Fluoride Treating of Titanium	36" x 144" x 60"
Passivate Inconel and Stainless Steel	36" x 144" x 60"
Prime and Paint Binks System	40 ft. Paint Booth
Wheelabrator Auto.	
Trinco Sand Blast Cabinet	48" x 96"

ASSEMBLY EQUIPMENT

Equipment Type:
Chicago Pneumatic Hot Dimpler
Chicago Pneumatic Compression Riveters (C-Squeeze)

Manufacturing Equipment List

Baldor 3/4 H.P. Polishing Station

Cleco Hand Held Air Riveters

Jet 14M Drill Press

Air Operated Sealer Dispensers

US Air Tool Auto Riveter (C-Squeeze) 36" throat depth

Assembly Vacuum System

AGE / STRESS RELIEF OVENS

Equipment Type:	Oven (Inside) Size:	Capacity:
Wisconsin Age Oven	14 ft. x 7 ft. x 25 ft.	500 degrees F 4 degrees F
Wisconsin Age Oven	10 ft. x 9 ft. x 30 ft.	375 degrees F 5 degrees F
Nafco Age Oven	8 ft. x 8 ft x 12 ft.	375 degrees F 5 degrees F
AHF Age / Stress Relief Ovens (2)	46" x 46" x 58"	1800 degrees F 10 degrees F
Oven Manhattan	6" x 7" x 20"	1400 degrees F
Oven	3" x 36" x 63"	1400 degrees F
Oven	9" x 9" x 24"	1400 degrees F

INSPECTION MACHINES

Equipment Type	Table Size	Part Size
SNK CMM-1600, Coordinate Measuring Machine	Variable, As Required	63" x 157" x 39"
L.K. Coordinate Measuring Machine	48" x 120" x 40"	48" x 120" x 40"
Mitutoya Coordinate Measuring Machine	28" x 60" x 18"	28" x 60" x 18"

Manufacturing Equipment List

Penetrant Inspection Booth 18 ft. x 14 ft. x 40 ft.

Surface Plates - Gage Blocks - Height - Gages - Optical Comparators

All Hand Held Micrometers, etc. (All Calibrated and Certified to NBS Standards)

QUALITY ASSURANCE

Phillips X-ray Tube & Vault, Model MGC20

Phillips X-ray Tube & Vault, Model MGC03

Automation/IUT Scanner, Model North 4' W x 10'L x 7'H

Automation/IUT Scanner, Model South 3' W x 21' L x 7' H

Matec Contour Following Scanner will detect internal Flaws in assemblies with compound and complex geometries. 4' W x 13'L x 7'H as the scanning envelope

HANDLING EQUIPMENT

Equipment Type	Lift Bar Size	Part Size
Overhead, Monorail Handling System	Variable, As Required	0.160" X 9.5 ft. X 45 ft.

MODEL DATA MANAGEMENT

Software: Version:

CAD / CAM Software

Unigraphics II with CATIA translator, Version 13.0 and IGES version 4 (3 Seats)

CAD / CAM Hardware

2 HP Model 715 (75 Stations), 1 X-Terminal

CAD Software

Cad Key Version 7 with IGES version 4

CAD Hardware

(4) P6-166*

CAM Software

Manufacturing Equipment List

CompuCor AS 3000 Version 5.0

Files utilized include: Native CATIA, IGES, DXF, DWG, CDL

NC PROGRAMMING / TOOL DESIGN

CATIA Version 4 Release 2.4 R1, (4) Full Seats of Design including Advanced Part Design & Detailing and (3) NCB/NC5 CATIA modules for NC Programming

CATIA Version 5 Release 10, (1) Full Seat of Design including Advanced Part Design

UNIGRAPHICS Version 19.0.1, (6) Seats of Design including (3) Full CAM Packages

Vericut Version 5.2.5

Qualified SNET / PGP V8.0 / PSN Encryption Capable Workstations

(1) Seat Fibersim Version 4.0 Composite Engineering Environment Software

Seat SolidWorks 2003 with Photworks, Featureworks, Animation, Cimlogic Toolbox and

COSMOSworks 2003 Statics Finite Element Analysis

AutoCAD Architectural Desktop Version 2.0 with AutoCAD 2000

(1) Verisurf Version 7.2C / MasterCam Design V7 CMM and Best Fit Software



TESTING CAPABILITIES

Solution Analysis

Grain Size Determination

Hydrogen Analysis

Alpha Case Determination

Selective Attack

Atomic Absorbtion

Intergranular Attack

Manufacturing Equipment List

Remelt / Recast Layers

TESTING

Equipment Type:

Hardness - Rockwell and Conductivity

Magnetic Particle Inspection

Penetrant Inspection

Thickness Testing - Organic and Inorganic

Adhesion Testing

Ion Chromatograph (Dionex/4000)

Gradient Pump Modules

Conductivity Detectors

UV-VIS Detector

Amperometric Detector

Advanced Chromatography Module

Hydrogen Analyzers (Hot Extraction Method)

Leco RH404 Electron Furnace

Leco 586-100 Analyzer

Atomic Absorbtion Spectrophotometer
(Perkin Elmer / 370)

Spectrophotometer
(Bausch & Lomb / Spectronic 21)

Optical Microscopes

Manufacturing Equipment List

Nikon Epiphot: Nikon FX-35A Polaroid Camera, Lasicofilar Eyepiece, (Magnification from x60 to x1000)

Metallographic Mounting/Polishing Equipment

Buehler Abrasimet Water Cooled Abrasive Cutter

Leco PR-22 Pneumatic Mounting Press

Leco VP-50 Vari/Pol Polisher

Leco BG20 Belt Grinder

Leco EP-50 Electropolisher / Electroetcher

Ion Analyzer
(Orion/EA 940)

Infrared Spectrophotometer
(Beckman / Acculab 2)

SHEET METAL EQUIPMENT

Equipment type:	Part Size (Inches):
DiAcro Hydro-mechanical Brake Press	48"
DiAcro Mechanical Brake Press	72"
Wysong Brake Press	72"
Trumpf TruBend 5085S CNC	108"
Accudyne	30" X 48"
DynaBil Industries	30" X 48"
K.R. Wilson	24" X 24"
Sheridan – Gray	45" X 72"

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Accudyne	60" X 40"
Wisconsin Die Pre-Heat Oven	60" By 36" X 42"
Curtis Machine Four Post Press	12" X 12"
Lake Erie	18" X 24"
SureForm 4 Post Press	24" X 42"
Dake "H" Shape	24" X 36"
EnerPak H Frame	12" X 24"
Verson Wheelon 10800	36" X 120" X 6"
Erco	80" X 72"
Hufford A – 10	120"
Rudel Punch Press	6" Stroke
E.W. Bliss Co.	8" Stroke
Pyramid Roller	60"
Slip Rollers (5)	Various
Chambersburg, DH #1	30" X 30"
Cincinnati	96" X .250"
2- Axis CNC Waterjet (Flow Intl)	48" X 96"
2- Axis CNC Waterjet (Flow Intl)	48" X 48"
2- Axis CNC Waterjet Dynamic (Flow Intl)	78" X 144"
5- Axis CNC Waterjet (Flow International)	60" X 108" X 24"
5- Axis CNC Waterjet (PaR Systems)	60" X 120" X 20"
Waterjet, C- Frame	36" X 36"

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Waterjet, C- Frame	36" X 36"
Waterjet, C- Frame	36" X 36"
Argon Weld Chamber	18" X 24" X 18"
Argon Weld Chamber	18" X 30" X 24"
Fusion Seam Welder	

MACHINED PARTS E QUIPMENT

Equipment type:

Haas VF – 3 (V)

CNC Masters PC JR. Mill

Lagun Universal (V)

Bridgeport Universal (V)

Bridgeport Universal (V)

Acer (V)

Acer (V)

Bridgeport Universal (V)

Bridgeport Universal (V)

LeBlonde Lathe

Browne & Sharpe Micro Excel,
Haas TM-2 3-Axis CNC Milling

Haas TM-2 3-Axis CNC Milling

Manufacturing Equipment List

Haas TM-2 3-Axis CNC Milling

Haas TM-3 3-Axis CNC Milling