

MANUFACTURING

LIST OF MACHINES



Machines and Capabilities

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01 Machining Centres

Pos.	Type of Machine	Technical Data	Manufacturer	Type
1	CNC 4-Axis High Speed Machining Centre Horizontal Integrated with Factory Automation Pallet-System "FASTEMS" with 56 Mach.-Pallets 400 x 400 mm 176 EURO-Pallets 800 x 1200 mm	Work Range: X = 560 mm Y = 560 mm / Z = 560 mm HSC-Spindle 50 - 20000 Rpm, Spindle: 22 kW, Tool Clamp: HSK 63 A ATC with 206 Pos. each Machine	MAKINO (Heidenreich & Harbeck)	A 55 a51nx
2	CNC 5-Axis High Speed Machining Centre Horizontal Integrated with Factory Automation Pallet - System" Fastems" with: 10 Machine pallets 800 x 1000 mm 9 Machine pallets 1000 x 1250 mm 92 Pallets to store Raw - Material	Work Range: ZT 800 / 130 ZT 1000 / 130 X = 1'600 mm 2'000 mm Y = 1'500 mm 1'600 mm Z = 1'320 mm 1'600 mm A = +60 -100 ° / B = endless HSC-Spindle 50 - 24 000 Rpm, Spindle: 40 kW, Tool Clamp: HSK 63 A ATC with 276 Pos. each Machine	STARRAG HECKERT	ZT 800/ 130 ZT 1000/ 130
3	CNC 5-Axis High Performance Machining Centre with Work Pallet Changer 3 Machine pallets 840 x 1000 mm Jig & Tool Manufacturing	Work Range: X-Axis 1350 mm Y-Axis 1150 mm Z-Axis 700/895 mm C-Axis 40 rpm A-Axis -120° / +16° HSC-Spindle 0 - 15000 rpm, Spindle: 38 kW / 193 Nm / HSK-A63 ATC with 92 Pos.	MIKRON	HPM 1350U
4	CNC 2-Spindle 5 Axis- Gantry Type, Vertical Profiler	Work Range: 1 Spindle in operation max.: X 14900 mm; Y 4000 mm; Z 600 mm 2 Spindle in operation max.: X 14900 mm; Y 1800 mm; Z 600 mm C +/- 185° / B +/- 110° No. of Tools: 60 per Spindle Spindle: 100 kW, 18'000 Rpm, HSK-A100	SCHURTER RETROFIT	PMS
5	CNC 3-Axis PORTATEC HSC twin contour high speed contour milling of Aluminium single sheet metal	Work Range: Work area 3'680 mm x 1'220 mm sheet metal thickness 0,4 - 8 mm Z-Axis 130 mm Twin spindle 5'000-60'000 Rpm; HSK-E25 ATC; 10 tools per Spindle Vacuum portal handling for sheet metal Vacuum table with 48 selectable sections work piece unloading table	MB-Portatec	BZ 37-12
6	CNC 4-Axis Profile Machining Centre Multi Profile System	Work Range: X-Axis 300 mm / Y-Axis 250 mm Z-Axis 250 mm / V-Axis 600 mm Max. profile cross-section: 67 x 67 mm Profile length 50 - 6000 mm Conveyer for continuous work piece transport A-Axis: Synchronised rotary device HSC-Spindle HSK-A32, 15'000 Rpm	CHIRON	MPS-08
7	Robot Machining Cell milling and trimming applications	CELL CONFIGURATION: Robot work envelope: 2135 mm Robot load capacity: 45 kg Spindle: 40'000 min-1; HSK-40 Turntable with 2 work stations: 1400 x 800 mm Working table: 2500 x 1000 mm	CARAT-ROBOTIC	STÄUBLI RX 170 L

Pos.	Type of Machine	Technical Data	Manufacturer	Type
8	NC-Vertical Milling and Drilling Machine	Work Range: X = 1500 mm Y = 1000 mm Z = 400 (850) mm Control system Haidenhein TNC 320	OERLIKON	KC 4
9	CNC 3-Axis vertical Machining Centre	Work Range: X-Axis = 1035 mm Y-Axis = 560 mm Z-Axis = 510 mm HSC-Spindle 0 - 15000 rpm, Spindle: 13 kW / 83 Nm / SK 40 ATC with 30 Pos.	DMG	DMC 1035 V eco
10	CNC 3-Axis vertical Machining Centre with A-Axis rotary device	Work Range: X-Axis = 635 mm Y-Axis = 510 mm Z-Axis = 460 mm HSC-Spindle 0 - 12000 rpm, Spindle: 13 kW / 83 Nm / SK 40 ATC with 30 Pos.	DMG	DMC 635 V eco
11	CNC-Univ. Milling and Drilling Machine	Work Range: X-Axis = 600 mm Y-Axis = 500 mm Z-Axis = 450 mm ATC with 24 Tool-Positions	DECKEL	FP4-60T
12	CNC- Drilling and Milling Machine Vertical	Work Range: X-Axis = 1000 mm Y-Axis = 435 mm Z-Axis = 720 mm	FEHLMANN	Picomax 100
13	Coordinate Drilling Machine Horizontal	Work Range: X = 600 mm / Y = 780 mm Z = 720 mm / Spindle Diam. 75 mm Digital Measure System	DIXI	75 A
14	CNC-Milling and Drilling Centre Vertical	Work Range: X = 580 mm, Y = 410 mm, Z = 480 mm ATC with Tool 22 Pos. Rpm 40 - 10 000	BRIDGEPORT	VMC 560
15	CNC-Milling and Drilling Centre Vertical	Work Range: X-Axis = 1000 mm Y-Axis = 500 mm Z-Axis = 550 mm 2 Pallet 500 x 1000 mm Rpm 40 - 8000	SIGMA	Zenit 3 P
		High speed machining FFS (flexible machining System) 3 MAKINO A55 and 1 a51nx connected by FASTEMS High performance machining FMS (flexible manufacturing System) Starrag ZT 1000, ZT 800 connected by FASTEMS Shown Part has been produced by FFS		

Pos.	Type of Machine	Technical Data	Manufacturer	Type
16	CNC-Univ. Milling and Drilling Machine	Work Range: X-Axis = 600 mm Y-Axis = 400 mm Z-Axis = 400 mm Spindle 10 - 5000 rpm, Spindle:9 kW SK 40	EMCOMAT	FB-600L

02 Lathe Machines

Pos.	Type of Machine	Technical Data	Manufacturer	Type
17	CNC-Turning & Milling Centre	Max. Turning length 503 mm X-1 & X2-Axis: 135 mm Z1 & Z2-Axis: 503 mm Y1-Axis Upper Turret: +/- 31 mm Spindle bore: 42 mm 2 Spindle 60-6000 min ⁻¹ with C-Axis Upper lower turret with each 12 Tools stations	NAKAMURA - TOME	WT -100 MMY
18	CNC-Turning Lathe 4 - Axis	Swing dia. 220 / over Bed 330 mm Max. bar dia. 51 mm C-Axis for Milling and Drilling Turret with 12 Tools stations	GILDEMEISTER	CTX 310 eco
19	CNC-Turning - Drilling - Milling centre 7 - Axis	Swing dia. 250 / horizontal Travel 460 mm Z-Axis: 500 mm / X-Axis 200 mm Y-Axis: 55 mm Spindle bore: 65 mm 2 Spindle C-Axis for Milling and Drilling Current Tools 12	SCHAUBLIN	TM - 6 Y

CNC-Turning- Drilling - Milling-Centre 7-Axis	
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03 Grinding Machines

Pos.	Type of Machine	Technical Data	Manufacturer	Type
20	Universal external & internal cylindrical grinding machine	Max. work piece size: External diameter: < 350 mm Length 675 mm CNC-controlled	Studer	favoritCNC
21	5 Axis-CNC-Tool and Cutter Grinding Machine	Max. Tool Dimensions Diameter 250 mm; Height 500 mm X-Axis = 341 mm Y-Axis = 240 mm Z-Axis = 240 mm	Michael Deckel	S20 turbo+

04 Sheet Metal Working Machines

Pos.	Type of Machine	Technical Data	Manufacturer	Type
22	Hydraulic "Fluid Cell" Press "QUINTUS" (Direct Acting Press)	For forming of sheet metal parts Rate press force: MN 400 Max. Forming pressure: 100 MPa No of tray loading stations: 2 Max. try depth: 220 mm Tray area with filler plate: 900 x 2300 mm	ASEA SWEDEN	QCF 400
23	Hydraulic-Straightening-Press	Pressure 60 to Stroke 500 mm Overhang 400 mm Program Selection	LINDENBERG	SSP 60
24	CNC 3-Axis Hydraulic Press Brakes	Pressure 80 to Work-Length Max: 2050 mm Between Housings: 1550 mm	E.H.T	Variopress
25	CNC 2-Axis Hydraulic Press Brake	Work Range: Max Press force 1'300 kN Work stroke 445 mm Max Bending length 3'230 mm Clearance between columns 2'690 mm distance to tool centreline 420 mm X-Axis 600 mm / R-Axis 250 mm	TRUMPF	TruBend 5130
26	Sheet Metal Straightening Machine	Mat-thickness 0,5 - 2,0 mm Max. Breadth 1400 mm 21 Rolls à 40 mm	MARIANI	SCIN 164
27	Plate Forming Roll Machine CNC controlled	Work length: 3600 mm Max. Mat. Thickness 1.6 mm With 800n/mm Radius-Minimum 30mm Rolls Diameter: 2 x 42, 8, 1 x 25,4	FARNHAM Retrofit Roder AG	1258 E
28	Stretch Wrap Forming Machine	Bending force 4 metric tons Work piece length: 400 - 2800 mm	WAERTLI	SBM-105
29	Laser marking	Diode power: 35 W Title block dimension: 110 x 110mm Clamping area: 650 x 600 mm X-Axis = 400 / Z-Axis = 400	ACI	DPL NEXUS Marker 163
30	CNC-Engraving Machine	Work Range: X-Axis 400 mm; Y-Axis 180 mm Z-Axis 300mm; 4. Axis rotary device HSC-Spindle 6 - 60 000 rpm	NILL+RITZ	U 4018
31	Circular Vibrator Finishers	Aluminium components: max diagonal 220 mm Drying Station Steel components: max length 70 mm	TROWAL	CB 300 G200 CD 110

Pos.	Type of Machine	Technical Data	Manufacturer	Type
32	Deburring-Brush-Machine	Flat metal sheets & plates: 0.4 to 10 mm thick Min work piece size 15 x 170 mm Max width 1350 mm Integrated pre-cleaning and drying station	WEBER	SB-N (o/u)-1350
33	Automatic Drilling and Riveting Machines (with sealants injection)	Throat depth 1800 mm Throat height 1200 mm Lower Tool Clearance: 225 mm Clamp Force 330 Lbs Rivet Upset force 13 300 Lbs Spindle Speed 500 to 8000 Rpm Machine can install either universal or countersunk head rivets from 3/32" to 7/32" - 1 inch long	RECOULES	PRECA-300

06 Sawing and Cutting

Pos.	Type of Machine	Technical Data	Manufacturer	Type
34	Fully-Automatic Universal Circular Saw	Mitre cuts +/- 90 Degrees Materials up to Ø 130 mm	Kaltenbach	KKS-400 NA
35	Squaring Shears	Capacity: 15 x 3000 mm (for Steel) 4 x 4040 mm (for Aluminium)	PROMECAN RAS	3100 Z 86.40

07 Tube Bending

Pos.	Type of Machine	Technical Data	Manufacturer	Type
36	CNC-Tube Bending machine with Tube Inspection Station	Bending Capacity: St37 Ø 18 mm x 2 mm AL/CU Ø 25 mm x 2 mm Max. Length: 3500 mm Max. Radius: 200 mm Min. Radius: 17 mm	MEWAG ROMER	RB 25 MD CNC
37	Swaging-Hydraulic Press	Spec. Press for Nuts, Sleeves, for tubes 1/4 "thru 1/2" System: HARRISON-SIERACIN	HARRISON	5806
38	Tube End-Finishing-Machine	specialMachine for: Flare Diameter Max. 2 in Bead Max. 1.5 in Square debur Max. 2 in	CONRAC	2 CP
39	High-Pressure Tubes Testing Bench	Spec. for: Hose and Tube-Manufacture Max. pressure: 8700 psi	TESTFUCHS	HÖP 600-2




Hydraulic system tube with Harrison System

08 Heat - Treatment Furnace

Pos.	Type of Machine	Technical Data	Manufacturer	Type
40	Heat Treatment Furnace (Approval based DPS 1.700 Class: C)	Max. Temp.: 550° C +/- 5°C Inside Dimensions: L 1800 x W 1000 x H 400 mm Water-Bath-Dim.: L 2000 x W 1100 x H 800 mm Digital Temperature recording	BOREL	Special
41	Heat Treatment Furnace (Elevator Type) (Approval based DPS 1.700 Class: C)	Max. 550°C +/- 5°C Inside Dimensions: L 4200 x W 1200 x H 1500 mm Water- Bath-Dim.: L 4500 x W 1400 x H 1500 mm Max. Charge weight: 2700 kg Digital Temperature recording	FAG	PE 615A

09 Composite Equipment

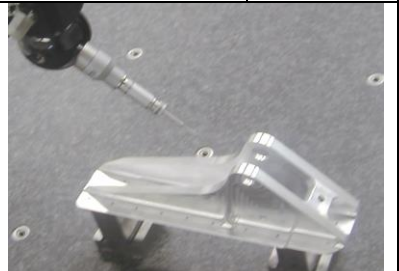
Pos.	Type of Machine	Technical Data	Manufacturer	Type
42	Electric Hot Air Autoclave (Approval based DPS 1.700)	Work Room: Diam. 1500 mm Depth 3000 mm Working-Temp.: 20-400 °C +/- 5°C Working pressure: 1-15 bar Microprocessor Controller Digital Temperature recording	SCHOLZ	38631
43	Electric Hot Air Autoclave (Approval based DPS 1.700)	Work Room: Diam. 2'000 mm Depth 4'000 mm Working-Temp.: 20-260 °C +/- 5°C Working pressure: 1.5 -18 bar Microprocessor Controller IPL-286 Digital Temperature recording	SCHOLZ	40721
44	Heated Platen Compression Press	Steel heating plates Temp. between 40-220°C +/- 4°C Table dimension: 3000 x 2000 mm Max. stroke 500 mm (Travel) Max. pressure 25 N / cm ² (1500 kN) Bar: 295	JOOS	HP-S150
45	Heated Plate Compression Press	Steel heating plates Temp. between 20-175°C +/- 5°C Table dimension: 700 x 700 mm Max. stroke 400 mm (Travel) Max. pressure 4.08 N / cm ² (200 kN) Bar: 314	JOOS	HP-S 20

Pos.	Type of Machine	Technical Data	Manufacturer	Type
46	Heated Platen Compression Press	Steel heating plates Temp. between 20-200°C +/- 5°C Table dimension 1500 mm x 800 mm Max. stroke 400 mm (Travel) Max. pressure 50N / cm2 (600 kN)	JOOS	HP-S 60
47	Heated Platen Compression Press	Steel heating plates Temp. between 20-200°C +/- 5°C Table dimension 2000 mm x 1500 mm Max. stroke 400 mm (Travel) Max. pressure 40 N / cm2 (1200 KN)	JOOS	HP-S 120
48	Convection Oven	Room-Dimensions: Width 1000 mm, Depth 1400 mm Height 1500 mm Max. Temp. 300°C +/- 3°C	REINHARDT	DT 21/300
49	Convection Oven	Room-Dimensions: Width 2000 mm, Depth 1400 mm Height 1700 mm Max. Temp. 250°C +/- 5°C	FLAEKT	Spec.
50	CNC-Precision Cutter for industrial single sheet fabric	Work Range: X-Axis 1650 mm Y-Axis 1800 mm Conveyer for continuous material feed Material clearance 30 mm Tangential cutting module Pneum. oscillating cutting tool Punching Tool Marking pen	ZÜND	Zünd Cutter LR-1600
<p>Electric Hot Air Autoclave (Approval based DPS 1.700)</p> <p>Work Room: Diam. 2'000 mm Depth 4'000 mm</p>				

10 Welding Equipment

Pos.	Type of Machine	Technical Data	Manufacturer	Type
51	MIG-MAC Welding Equipment	Water cooled: From 220 Amp to 400 Amp Gas cooled 220 Amp	OERLIKON	div.
52	TIG-Welding Equipment	Water cooled 360 Amp	OERLIKON and L-TEC	div.

11 Measuring Systems

Pos.	Type of Machine	Technical Data	Manufacturer	Type
53	CNC-Coordinate Measuring Machine Bridge Type	Axis movement: X = 1400 mm Y = 860 mm / Z = 660 mm Granite Base Automated Probe Head 3- Axis: RENISHAW PH 10 M / TP 200 Software: PC-DMIS CAD++ Software interface: CAD UNIGRAPHICS	D.E.A.	SCIROCCO 14.09.07
54	CNC-Coordinate Measuring Machine Bridge Type	Axis movement: X = 1200 mm / Y = 3000 mm Z= 1000 mm, Granite Base Motorized indexing probe head: TESASTAR-m – max. component 2250 kg Leitz Standard Probe LSP-X1H Anti-Vibration: Air System air-conditioned-Room Software: PC-DMIS CAD++ software interface: CAD UNIGRAPHICS	DEA Global Silber	12.30.10
55	Manual Theodolite 3 D Measuring System (MTMS)	2 Theodolites in combination with a computer in connection with CAD UNIGRAPHICS Printer, Monitor	LEICA	XYZ
56	Portable Measuring Arm	Working volume 3.0 m Single Point Accuracy ± 0.019 mm Software CAM 2 measure	FARO	Platinum Arm 3.0
57	API Laser Tracking III	Interferometer Repeatability ± 2.5 μ m Absolute Accuracy static ± 5 μ m Absolute Accuracy dynamic ± 10 μ m Turbo ADM Absolute Accuracy static ± 15 μ m IntelliProbe 360° Measuring Software Spatial Analyser	AUTOMATED PRECISION INC.	Tracker 3
				
				CNC-Coordinate Measuring Machine

12 Surface Treatment - Coating

Pos.	Type of Machine	Technical Data	Manufacturer	Type
58	Surface Treatment / Coating	Chromic Acid Anodising: 2.8 x 1.8 x 0.8 m Cadmium Coating: 1.0 x 0.5 x 0.6 m Nickel Phosphorus Coating: 1.0 x 0.5 x 0.6 m Chromic Acid Anodising: 3.0 x 0.5 x 1.0 m Stripping: 0.5 x 0.5 x 0.6 m	ERNE GALVABAU	Special
59	Surface Treatment / Coating	The Surface Treatment incorporates all the latest technology including computer – controlled Process Max. Work piece Size: 2.8 x 1.8 x 0.8 Processes: Degreasing, Pickling, Chromating, Phosphating	GALVABAU	Special
60	CleanLASER Workstation	precise de-coating of bonding points Continuity contacts for aerospace Diode pumped laser: 150 W 1064 Nd: YAG 2D laser mirroring optic X-Axis 1200 mm Y-Axis 400 mm Z-Axis 500 mm	Clean Lasersysteme	CL 150

13 Surface Treatment - Painting

Pos.	Type of Machine	Technical Data	Manufacturer	Type
61	Primer / Paint Spray & Dry Carousel	Temp. 22°C to 80°C Application of primer-paint to small Parts: Max dimension 600 x 600 mm	LUEM	Special
62	Primer / Paint Spray & Dry Cabin	Temp. 22°C to 60°C Application of primer-paint to large Parts: Max dimension 2000 x 2000 mm	LUTERBACH	Special
63	Surface Treatment-Painting	20°C Hangar Dimensions: L 21.5 m / W 18.7 m / H 5.5 m 25°C Spray Cabin Dimensions: L 11.3 m / W 4.9 m / H 4.0 m 80°C Drying Oven Dimension: L 11.2 m / W 4.9 m / H 4.0 m 250°C Heated Drying Cabin Dimensions: L 4.3 m / W 2.0 m / H 2.5 m	OLPI / DUERR	
	Surface Treatment / Coating	