



## Plant List

### - CNC Milling -

Number of machines	Name and type	Specifications	Travels & Accuracy	
3	High Performance Machining Centre Versa 645 linear 5 Axis (Fehlmann AG)	<ul style="list-style-type: none"> <li>&gt; 5-axis machining</li> <li>&gt; with EROWA robot</li> <li>&gt; simultaneous machining</li> <li>&gt; control: Heidenhain</li> <li>&gt; number of tool pockets: 225</li> <li>&gt; max. spindle speed: 30.000 rpm</li> </ul>	XYZ travels:	X = 350 mm Y = 500 mm Z = 300 mm
			Accuracy:	2 µm
1	Machining Centre PICOMAX P95 (Fehlmann AG)	<ul style="list-style-type: none"> <li>&gt; 3-axis machining</li> <li>&gt; number of tool pockets: 80</li> <li>&gt; control: Heidenhain</li> <li>&gt; max. spindle speed: 18.000 rpm</li> <li>&gt; precision machining of mounting plates</li> </ul>	Table:	1600mm x 550 mm
			Travels:	X = 800 mm Y = 500 mm Z = 610 mm
			Accuracy:	5 µm
4	Machining Centre PICOMAX 90 – M (Fehlmann AG)	<ul style="list-style-type: none"> <li>&gt; 5-axis machining</li> <li>&gt; simultaneous machining</li> <li>&gt; number of tool pockets: 48</li> <li>&gt; control: Heidenhain</li> <li>&gt; max. spindle speed: 20.000 rpm</li> <li>&gt; 1x with EROWA robot capable of feeding 2 machines</li> </ul>	Table:	1260 mm x 490 mm
			Travels:	X = 705 mm Y = 425 mm Z = 610 mm
			Accuracy:	5µm
1	Machining Centre SABRE 750 (Cincinatti)	<ul style="list-style-type: none"> <li>&gt; 4-axis machining</li> <li>&gt; control: Heidenhain</li> <li>&gt; number of tool pockets: 21</li> </ul>	Table:	950 mm x 520 mm
			Travels:	X = 760 mm Y = 510 mm Z = 510 mm

## - CNC Milling -

Number of machines	Name and type	Specifications	Travels & Accuracy	
1	Machining Centre PICOMAX P60 (Fehlmann AG)	> 5-axis machining > control: Heidenhain > number of tool pockets: 24	Table: Travels:	920 mm x 390 mm X = 500 mm Y = 355 mm Z = 610 mm
1	Machining Centre PICOMAX P56 (Fehlmann AG)	> 4-axis machining > control: Acramatic > number of tool pockets: 20	Table: Travels:	900 mm x 480 mm X = 500 mm Y = 400 mm Z = 400mm
1	Machining Centre PICOMAX P54 (Fehlmann AG)	> 3-axis machining > control: Acramatic > number of tool pockets: 12	Table: Travels:	880 mm x 320 mm X = 500 mm Y = 260 mm Z = 160 mm

## - Additive Manufacturing -

Number of machines	Name and type	Specifications	Build Envelope & Accuracy	
2	EOS M290 available via our cooperation partners	> EOS Print > 3D metal printing	Build volume: Accuracy:	□ 250 mm x 325 mm x 250 mm (height) 0.1 mm - 0.2 mm
2	EOS M100 available via our cooperation partners	> EOS Print > 3D metal printing	Build volume: Accuracy:	∅ 100 x 95 mm 0.1 mm - 0.2 mm

## - CNC Turning -

Number of machines	Name & type	Specifications	Machining Capacity & Accuracy	
1	Turning & Milling Centre NTX 1000 (DMG Mori Seiki)	<ul style="list-style-type: none"> <li>&gt; 9-axis machining</li> <li>&gt; bar feeder</li> <li>&gt; control: Sinumerik (CELEOS)</li> <li>&gt; max. tool spindle speed: 20.000 rpm</li> <li>&gt; tool storage capacity: 78 tools</li> <li>&gt; max. spindle speed: 6000 rpm</li> <li>&gt; number of tool pockets (turret): 12</li> </ul>	main spindle chuck $\varnothing$ : counter spindle chuck $\varnothing$ : bar work capacity:	210 mm 170 mm $\varnothing$ 65 mm
1	CNC Lathe CD-402 (DMT / Kern)	<ul style="list-style-type: none"> <li>&gt; control: Heidenhain MANUALplus 620 HSCI</li> <li>&gt; driven tools</li> <li>&gt; turret with 6 tool pockets</li> <li>&gt; max. speed: 4000 rpm</li> </ul>	main spindle chuck $\varnothing$ : bar work capacity:	$\varnothing$ 210 mm $\varnothing$ 64 mm
1	CNC Lathe Hawk 200 (Cincinatti)	<ul style="list-style-type: none"> <li>&gt; control: Acramatik</li> <li>&gt; turret with 12 tool pockets</li> </ul>	main spindle chuck $\varnothing$ : bar work capacity:	210 mm $\varnothing$ 65 mm
1	CNC Lathe Hawk 150 (Cincinatti)	<ul style="list-style-type: none"> <li>&gt; control: Acramatik</li> <li>&gt; turret with 12 tool pockets</li> </ul>	main spindle chuck $\varnothing$ : bar work capacity:	$\varnothing$ 170 mm $\varnothing$ 51 mm
3	conventional lathes	<ul style="list-style-type: none"> <li>&gt; 2x mechanic's lathe</li> <li>&gt; 1x turret lathe</li> </ul>	fine-tuning work / matching work machining of small parts	

## - Grinding -

Number of machines	Name and type	Specifications	Machining Capacity & Accuracy	
1	cylindrical grinding machine (SU 200 x 630)	> control: conventional	max. length max. diameter	630 mm 110 mm
1	internal grinding machine (SI 125 x 175)	> control: conventional	max. length max. diameter	175 mm 4 -125 mm
1	cylindrical grinding machine (Studer)	> control: conventional	max. length max. diameter	150 mm 20 mm
1	surface grinding machine (Jung)	> control: conventional > precision grinding	table:	550 mm x 200 mm
1	surface grinding machine (FSW)	> control: conventional > precision grinding	table:	600 mm x 200 mm

## - Threading -

Number of machines	Name and type	Specifications	Machining Capacity & Accuracy	
1	Thread Rolling Machine GWR 80 x 120	> control: conventional > thread rolling	M3 x 0.5mm - M12 x 1.75mm special threads on request	

## - Cutting -

Number of machines	Name and type	Specifications	Machining Capacity & Accuracy	
3	1x automatic band saw HBP 313 A 2x plate shears	> control: conventional	max. diameter: flat material: metal sheet max. thickness: max. part dimensions :	310 mm 300 mm  2.5 mm - 4 mm 500 mm x 1500 mm

## - Engraving / Printing -

Number of machines	Name and type	Specifications	Machining Capacity & Accuracy	
2	Laser processing system PIRANHA III FL20 (ACSYS)	> 4th and 5th axis > control: ACSYS > laser power: 20 Watt	max. part dimensions :	X = 660 mm Y = 375 mm Z = 380 mm
			max. rotational diameter	100 mm
			max. workpiece weight:	10 kg
2	linear dividing engine	> control: conventional	max diameter:	1 - 2000 mm
1	engraving machine	> control: conventional	max diameter:	400 mm
1	drum dividing engine	> control: conventional	max diameter:	350 mm
1	pad printing machine	> control: conventional	max. workpiece dims:	250 mm x 120 mm

## - Finishing -

Number of machines	Name and type	Specifications	Media	Machining Capacity
3	1x Twister (automatic sand blasting machine)	> control: Siemens SPS	glass bead / stainless steel	workpiece Ø 110 mm
	1x manual sand blasting machine	> control: conventional	glass bead / corundum	250x 500 x 250 mm
	1x vibratory finishing machine (Rösler)	> control: conventional	various media types	150 x 150 x 150 mm
2	1x solvent system Höckh (ultrasonic)	> control: Siemens SPS	perchloroethylene	250 x 150 x 150 mm
	1x aqueous part cleaning machine Mafac (ultrasonic)	> control: conventional	water-based cleaning	250 x 150 x 150 mm

## - CAD | CAM -

Number of licenses	System	File formats
3	Solid Works	DXF, DWG, STEP, ACIS, IGES, VDAFS, STL, VRML, Parasolid
3	1x Hypermill 1x Solid CAM 1x Esprit	DXF, DWG, STEP, ACIS, IGES, VDAFS, STL, VRML, Parasolid

## - Assembly & Testing -

Number of machines	Type of equipment	Features
6	1x positioning device 2x walk-in temperature chamber 1x vibration testing equipment 2x drop test machine	precise positioning of optical parts and components temperature testing -30°C ... +70°C, verification of any influences on instruments testing of different vibration amplitudes up to 25 g can be simulated, corresponding to a drop from a height of 2.5 meters

Extensive equipment for the manufacture, adjustment and testing of optical-mechanical parts, sub-assemblies and instruments. We can do flame-brazing, soft-soldering and manual polishing. Collimator test equipment for focal lengths up to 5000 mm.

### - Other Machining Processes -

(available via our cooperation partners)

honing lapping deep-hole boring thermal treatment polishing	wire cutting and die-sinking water jet cutting and laser cutting welding, flame brazing surface finishing large-scale production
---	--

### - Materials -

aluminum alloys brass bronze steel stainless steel hardened steel	nickel Inconel Invar magnesium titanium special materials   plastics
--	---