

List of Machinery & Processes



Your partner for:

High-precision mechanics

Precision mechanical subassemblies

Surface treatment

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Precision Milling

Materials: Aluminum, Stainless Steel, Aluminum Cast
Surface: $Ra \leq 0.2$ (depending on machine and process)
Accuracy: Tolerance up to 0.005 mm (depending on machine and process)

Number	Specification		Processing range [mm]		
			X	Y	Z
4	5-Axis Machining Center HERMLE C42 Robot for material, part, and pallet handling. Low staff 7/24h – operation. 504 Tool places on each machine tool. Spindle speed 20'000 min ⁻¹ Tool system HSK-A63. TNC640 Heidenhain control unit with option <u>high accuracy package</u> .		800	800	550
4	5-Axis Machining Center DMG DMC 60 U 180 and 303 Tool places Simultaneous 5-axis- and 5-sided machining Spindle speed 18'000 min ⁻¹ Tool system HSK-A63. ITNC530 / TNC640 Heidenhain control unit Pallet changer with 10 places each. With option <u>high accuracy package</u> .		600	750	600
3	5-Axis Machining Center DMG DMU 50 3rd Generation 60 Tool places Simultaneous 5-axis- and 5-sided machining Spindle speed 20'000 min ⁻¹ . Tool system HSK-A63. TNC640 Heidenhain control unit.		650	520	475
1	5-Axis Machining Center DMG DMU 50 30 Tool places 5-axis- and 5-sided machining Spindle speed 10'000 min ⁻¹ . Tool system ISO40. ITNC530 Heidenhain control unit.		500	450	400

Precision Turning

Materials: Aluminum, Brass, Nitriding Steel, Stainless Steel, Titan, Dispal
Surface: $Ra \leq 0.4$ (depending on material and machine)
Accuracy: Tolerance up to 0.005 mm (depending on geometry and material)

Number	Specification		Processing range [mm]	
			Max. Ø	Max. length
2	Multifunctional Machining Center (Turning-Milling) Index R300 Main and counter spindle with 2 additional milling spindles Simultaneous milling process by parallel machining on main and counter spindle. 140 Tool places Machining from the bar or in chuck		100 (Bar) 200 (Chuck)	250
1	Turning-Milling Machining Center Index G300 Complete machining in Chuck With counter spindle. Two 12-fold-revolvers with driven tools Fully automatic gantry loading system Incl. B-Axis		180	300
2	Turning-Milling Machining Center Index G220 Machining from the bar With counter spindle. With separately milling spindle and a magazine with 140 tools One 18-fold revolver with driven tools Incl. B-Axis		65	250
2	Turning-Milling Machining Center Index G200 Machining from the bar with bar loading magazine. With counter spindle. Three 14-fold-revolvers with driven tools With separately milling spindle and a magazine with 6 tools Incl. B-Axis		65	200

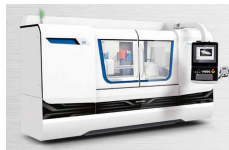
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Number	Specification		Processing range [mm]	
			Max. Ø	Max. length
2	Turning-Milling Machining Center Index C200 Machining from the bar with bar loading magazine. With counter spindle. Three 10-fold-revolvers with driven tools		90	70
1	Turning-Milling Machining Center Index C65 Machining from the bar with bar loading magazine. With counter spindle. Three 12-fold-revolvers with driven tools		65	70
2	CNC Precision Lathe Schaublin 842 For high precision finish machining in the chuck 16-fold revolver		100	100

Precision Grinding / Honing

Materials: Aluminum (hard anodized), Steel, Hardened Steel, Brass
Surface: Ra ≤ 0.10
Accuracy: Roundness < 0.0003 mm, Cylindricity < 0.001 mm, Flatness < 0.001 mm, Concentricity < 0.002 mm, Tolerance: diameter and linear dimension < 0.002 mm, Match-tolerance < 0.001

Number	Specification		Processing range [mm]	
			Max. Ø	Max. length
2	CNC Universal Grinding Center Studer S41 (C-Axis) Cylindrical-, Form- and Thread grinding. Internal and external grinding. In-process measurement control. High Speed Machining. Synchronous tailstock (makes it possible to process without carrier).		400	350
1	CNC Grinding Center Studer S145 Cylindrical grinding (internal and external) Special software for internal grinding. Robot for load and re-loading. Incl. measurement control.		350	400
1	CNC Grinding Center Studer S145 Cylindrical grinding (internal and external) Special software for internal grinding.		350	400
1	CNC Grinding Center Studer S40 Cylindrical-, Form- and Thread grinding. External complete machining Measurement and control system for pair grinding . Manually operated or fully automated. Robot for load and re-loading. Incl. measurement control.		350	400
1	CNC Grinding Center Studer S31C Cylindrical-, Form- and Thread grinding. Internal and external machining. High Speed Machining. Robot for load and re-loading. Incl. measurement control.		320	220

Number	Specification		Processing range [mm]	
			Max. Ø	Max. length
1	CNC Grinding Center Studer S31 Cylindrical-, form- and thread grinding External complete machining. Measurement and control system for pair grinding. Manually operated or fully automated. Robot for load and re-loading. Incl. measurement control. Synchronous tailstock (makes it possible to process without carrier).		320	220
1	CNC Grinding Center Studer S31 Cylindrical- and thread grinding External complete machining. With the option <u>Shoe-Grinding</u> for very thin-walled workpieces (rings).		320	220
1	CNC Grinding Center Studer S131 Cylindrical grinding (internal and external). Special software for internal grinding.		300	300
1	CNC Grinding Center Studer S31 Cylindrical-, form- and thread grinding External complete machining. Measurement and control system for pair grinding. Manually operated or fully automated. Robot for load and re-loading. Incl. measurement control. Synchronous tailstock (makes it possible to process without carrier).		340	400
1	Honing Machine Sunnen ML2000		165 (man.) 100 (autom.)	170

Also available supporting processes at Polymeca:

- Surface lapping
- Flat grinding
- Laser marking

Measurement Technology

Inspection room according VDI/VDE 2627, Grade 3, ± 0.5 °C/h					
Number	Specification		Measuring range [mm]		
			X	Y	Z
1	High Precision Coordinate Measuring Machine Leitz PMM C 12107 Accuracy in μm (L in mm): $E = 0.7 + L/400$ $P = 0.6$		1'200	1'000	700
1	Precision length measuring instruments Mahr ULM520-SE $U1 = (0.09 + L/2000) \mu\text{m}$		520	-	-
2	CNC Precision Formtester Mahr MMQ 400 Accuracy in μm : Roundness ≤ 0.1 Flatness ≤ 0.1 Cylindricity 1.0/100mm Straightness 0.25/100mm Right angel ≤ 0.1		Ø 350	-	300
1	Shape- and Roughness Device MahrSurf DU 130 Accuracy in μm (L in mm): $EA = 1.0 + 2 L/150$ Resolution in Z = 2 nm		130	-	10

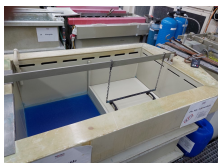
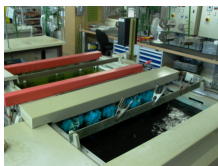
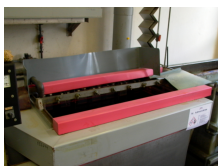
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Inspection room according VDI/VDE 2627, Grade 4, ± 1.0 °C/h					
Number	Specification	Measuring range [mm]			
		X	Y	Z	
1	Coordinate measuring machine Leitz Reference Xe 10.7.6 Accuracy in μm (L in mm): $E = 1.4 + L/350$ Repetability range in μm : $R = 0.9$				
1	Coordinate Measuring Machine Leitz Reference 15.9.7 Accuracy in μm (L in mm): $E = 1.0 + L/350$ $P = 1.0$				
1	Optical CMM Tesa Visio 300 GL manual $MPE_{xy} = (2,5 + 4 L/1000) \mu\text{m}$ $MPE_z = (2,9 + 5 L/1000) \mu\text{m}$				
1	Leitz Sirio Xi Shop Floor CMM With pallet system Accuracy μm (L in mm): $E0 = 1.7 + L/300$				

Surface treatment

Anodizing:	Aluminum-Alloys
Passivation:	Aluminum-Alloys
Electroplating:	Aluminum-Alloys, Steel, Stainless Steel, Copper, Brass, Non-Ferrous Metals
Painting:	Aluminum-Alloys, Steel, Non-Ferrous Metals, Plastics, Composite Materials

Anodizing			
Specification	Max.component size [mm]		
	L	W	H
Anodizing Fully automatic system GS-process colorless and organic coloring. Colors: deep-black, gold-orange, blue, red, violet, green, and other on request. Corrosion protection, decorative layers, wear protection. For Aluminium und Aluminium alloys.	2'500	600	1200
			
Passivation of aluminum Fully automatic system. Transparent (SurTec 650). Ideal priming for paints. Brilliant conductor (EMV). For aluminum and aluminum alloys.	2'500	600	1200
			
Chemical Gloss Manually operated. High gloss surface. Together with glass pearl blasting gives a satin finish. For aluminum and aluminum alloys.	800	600	700
			

Electroplating				
Specification		Max.component size [mm]		
		L	W	H
Burnishing for stainless steel (SWOX) Decorative black surface. Light corrosion protection. Only for stainless steel.		600	400	1'000
Stainless steel passivation Homogenization for surfaces. Better corrosion protection. For stainless steel.		400	400	600
Blue annealing for brass Rich black, decorative. Reduces stray light in the optical industry. Less measure removal. For brass with Cu-content from 58 till 65 %.		500	600	600
Electrolytic copper plating Ductile, light bright (preserved shiny) For steel, aluminum, brass, and die-cast zinc with pre-treatment.		1'200	600	1'000
Nickel plating, chemical Bright layers. Corrosion- and wear protection. Non-magnetic, 480 till 560 HV. With heat treatment (400°C / 1h) approx. 1'000 HV P-content ~ 9 till 13 %. For iron, aluminum, copper, brass.		1400	600	800
Shiny Chrome plating High-shine surface, decorative. Max. coating area 18 dm². Layer thickness tolerance ±0.005 mm. For iron, copper, brass.		1'200	600	1'000
Black chrome plating Decorative black coating with high corrosion protection. Prevent reflections on optical layers. Max. coating area 18 dm². Layer thickness tolerance ±0.002 mm For iron, copper, brass, and stainless steel.		1'200	600	1'000

Industrial Wet Painting					
Number	Specification		Max.component size [mm]		
			L	B	H
1	Dust-free Spray booth CMC Industrie 350 Maximum part weight: 1'000kg. Drying of paint in the cabin possible. Water- und solvent based paint 1- and 2-Component Systems. Structure painting and stove-enamel up to 240°C.		8'200	3'400	2'300
5	Spray booth ICS / 140 Maximum part weight 10kg. Drying of paint in the cabin possible. Water- und solvent based paint. 1- and 2-Component Systems. Structure painting and stove-enamel up to 240°C.		1'000	1'000	600
Industrial Powder Painting					
1	Powder coating cabin Electrostatic Method. Maximum part weight 25kg. Plain- and Structure coating. Stove-enamel up to 240°C.		1'900	1'500	2'800

Additional Processes

US-Cleaning, Cleaning

Vibratory Finishing

Blasting

Laser Processing (Laser Marking, Removal of paint and anodized layers)

Specification		Max.component size [mm]		
		L	W	H
Coating Thickness & Analysis System Automatic Part Recognition Autofocus & Auto-Approach		500	400	150
Ultrasonic Cleaning Semi-automatic cleaning facility. Ultimate cleanliness. If required packaging under flow box.		1'200	800	1'000
Ultrasonic Cleaning Machine Shop floor full-automatic cleaning unit.		480	660	340
Tumble Deburring / Vibratory Grinding For the removal of burrs and to reaching a uniform grinded surface. Several machines installed in different places.		div.		
Sand- and Glass Pearl Blasting		div.		
Sand Blasting Blasting medium: Al ₂ O ₃		1000	800	500

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Glass Pearl Blasting Blasting medium: Glass pearls		600	500	250
Powder Blasting Blasting medium: SiC powder		500	300	250

Laser Processing (Laser Marking, Removal of paint and anodized layers)

Number	Specification	Max.component size [mm]		
		X	Y	Z
1	TruMark Station 5000 with Trumpf Laser marker. TruMark 3130 max. part dimension: 680 mm x 500 mm x 700 mm max. part weight: 25 kg 	290	290	(500)

Assembly Technique

For your benefit: Reduction from logistical and storage effort

Complete solutions from a single source:

Procurement - Machining - Surface treatment - Assembly - Testing.

Assembly area

Infrastructure:

- Automatic thread insert assembly
- Assembly robot for small parts
- ESD-protected area (for electronic Assembly)
- 3D-glueing robot
- Glueing carousel
- Flow Boxes
- Curing oven



Engineering of control systems

- With functionality- and tightness test-bench for hydraulics and pneumatics
- Assembly of components for engineering
- Control cabinets and control systems
- Testing in accordance with EN61439-1 2011

