



Mechanical Engineering / Aerostructures - List of Equipment

Production plant Altdorf

Air conditioned machining and assembly of heavy part

CNC vertical milling/turning

Equipment	mounting table (mm)	machining range max	inside diameter max	number of tools	remarks
• Waldrich-Coburg MultiTec	4000 x 2250	5000 x 3500 x 2250	2500	192	5-axis machining
• Waldrich-Coburg MultiTec	4000 x 2250	5000 x 3500 x 2250	2500	192	5-axis machining
• Waldrich-Coburg MultiTec	3000 x 2000	4000 x 3500 x 2250	2500	192	5-axis machining
• Waldrich-Coburg MultiTec	3000 x 2000 rotary table ø 2500	4000 x 3500 x 2250	2500	192	5-axis machining turning and milling
• Waldrich-Coburg MasterTec 4000	4000 x 2250 rotary table ø 3000	5500 x 5000 x 3500	4000	192	5-axis machining turning and milling
• DMG DMC 340 FD	rotary table ø 2500	2800 x 3400 x 1600	2800	180	5-axis machining turning and milling
• DMG DMC 340 FD	rotary table ø 2500 turning and milling	2800 x 3400 x 1600	2800	240	5-axis machining
• DMG DMC 200 FD	rotary table ø 1850 turning and milling	1800 x 2000 x 1100	1950	240	5-axis machining
• STAMA MC 550/S		4000 x 1000 x 700		45	milling

Attached to automatic transfer system, up to 29 pallets

1700 m² additional area for assemblies with a weight up to 63 tons.

Inspection and marking devices

Coordinate Measuring Machine CMM	uncertainty of length measurement	max. range	remarks
• Zeiss MMZ-G CNC	by ISO 10360-2 -MPE_E = 3.5+L/400µm (L=Length of measurement in mm)	3000 x 6000 x 2000	Vast Gold Scanning probe max. length of probe 800mm

marking Equipment	max range	remarks
• Wenzel RS	3000 x 2000 x 2100	weight max. 10000 kg

Tool making

CNC milling and grinding

Equipment	mounting table	machining range	number of tools	remarks
• DMG DMU 80P	900 x 630	800 x 700 x 600	30	5-axis machining
• DMG DMU 70 e Volution	700 x 500	750 x 600 x 520	60	5-axis machining
• DMG DMU 70 V	700 x 500	710 x 520 x 520	60	5-axis machining

• DMG DMU 100 Monoblock	1500 x 800	1250 x 710 x 710	60	integrated NC-rotary table ø 800 mm
• Brother TC 210	280 x 500	300 x 220 x 200	10	drilling
• Makino EDNC 43-MR	500 x 700	450 x 350 x 350	8	penetration eroding C-axis

CNC turning

Equipment	max. turning length	max. turning dia	remarks
• Heyligenstaedt Heynumat 24	2000	700	backstay ø 600
• Boehringer VDF 250 C	1000	350	drag-footstock/backstay ø 160
• Boehringer VDF 180 Cm	1000	250	powered tools/backstay ø 100
• Kern CD 650	2000	650/420	cycle controlled

External cylindrical grinding machine

Equipment	max. length between centers	max. height of center	remarks
• Kellenberger UR 175 x 1500	1500	175/225	
• Studer S 30-22R	300	125	profile machining

internal cylindrical grinding machine

Equipment	max diameter-ø	max. depth/length
• Kellenberger UR 175 x 1500	250	300
• Tripet Mar 200 A	80	120

CNC profile- and flat grinding

Equipment	max. length	max. width	max. height of part
• FAVRETTO MC 160	1500	650	650

Coordinate grinding machine

Equipment	mounting table	machining range	max. weight
• Hauser S 35-400	600 x 380	500 x 500 x 450	200 kg

For conventional machining there is additional turning, milling, drilling and inscription equipment available.

Constructional steelwork

Equipment	Brand	working range
<ul style="list-style-type: none"> • profile bending machine • hydraulic straightening press • overhead traveling crane up to 10 tons • swivel-tilt devices • sheet metal rolling 	Comac 3025 HV 2 biggest possible bending profile	<ul style="list-style-type: none"> • $\varnothing > 1000$, different sets of rollers • flat profiles 100/20 • 100 t/Stroke 500mm
<ul style="list-style-type: none"> • MIG/MAG-welding devices • WIG TIG-welding devices • manual arc-welding device 		<ul style="list-style-type: none"> • 300 kg up to max. 4000 kg • 8mm up to max. 1500mm

State of the art equipment for prototypes and serial production.

Specialized in low alloyed steel, alloyed steel, Titanium, Copper, Plastics, stainless steel and aluminum alloys.

Certifications: Betriebsausweis SIA 263 (H3)
Grosser Eignungsnachweis DIN 18800

Welding technology: European Welding Specialist EWS-CH 04.484
Schweissfachmann (SFM) International Welding Specialist IWS-CH 04.484
Certified Welding Specialist according to EN 287-1

Welding constructions: (applications) plant engineering
machine building
constructional steelwork
Wear and tear protection
Bath- and galvanic constructions

Production plant Emmen

CNC machining

Equipment	mounting table	machining range	inside-diameter max.	number of tools	remarks
• Henri Liné Powermill 260 V	10000 x 4200	11000 x 3250 x 1200	4200	2 x 50	5-axis machining, double-spindle
• Henri Liné Macbormill 245	9000 x 2500	10000 x 3500 x 2000	2500	20	5-axis machining
• Makino MAG3	1500 x 3000	3000 x 1500 x 1000		120	5-axis machining, 6 pallets
• Makino MAG1	1000 x 800	1520 x 1100 x 1350		120	5-axis machining
• Makino MAG1	1000 x 800	1520 x 1100 x 1350		120	5-axis machining
• DMG DMF 300	3400 x 600	3000 x 560 x 720		100	fixed table
• DMG DMF 300	3400 x 600	3000 x 560 x 720		100	fixed table
• DMG DMU 100	795 x 1500	1150 x 710 x 710		32	5-axis
• DMG DMC 200 FD	rotary table \varnothing 1850	1800 x 2000 x 1100		120	5-axis machining, 2 pallets

1 system MASA5
with 30 pallets

• DMG DMC 200 FD	rotary table ø 1850	1800 x 2000 x 1100	120	5-axis machining, 2 pallets
• Wissner Witec 4015	4000 x 1500	4000 x 1500 x 120	10	vacuum clamping pallet
• Güdel CMM LH 2015		18000 x 1000 x 1000		

Sheet metal and welding

Equipment	pressing force	range	remarks
• Hydroform-press Avure Technologies QUINTUS QFL	800 bar	980 x 980	2 tables, ø 1100mm
• lengthening and drawing-press ACB Nantes (Alstom) Loire FET 400	400 t	2100 x 3000	
• chemical milling Alkalin Typ 2		2350 x 2200 x 800	
• welding device Jetline LWP 120		3050 x 1010 x 12000	weight max. 1000 kg
• vacuum-welding-device		1700 x 700	vacuum 10 ⁻³ mbar

Bonding and composites

Equipment	range	temperature	volume	remarks
• pretreatment bathes	3000 x 1700 x 600	70° C		
• clean room		250° C	30 x 18.5 m	
	chamber size			
• autoklav, Scholz	ø 2000 x 4500mm	20 - 320° C		16 bar
• autoklav, Scholz	ø 2000 x 4500mm	20 - 320° C		16 bar
• autoklav, Scholz	ø 3800 x 8000mm	20 - 250° C		15 bar
• resin injection Resin Transfer Molding DOPAG		250° C		
• resin injection Resin Transfer Molding Isojet		180° C		1 and 2 components

Heat- and surface treatment

Equipment	chamber size	temperature	batch size	remarks
• solution annealing Ripoche (Aluminum/Titan)	4200 x 1500 x 2000	max. 700° C	1250 kg	
• age hardening Schmitz and Apelt Aluminum	4500 x 2000 x 2400	max. 620° C	1500 kg	

	chamber size	mounting table ø	
• steel blasting plant USF MP1500TI	1500 x 1000	360	6-axis
• glass blasting plant USF MP 1200	ø1200 x 780	360	3-axis
	chamber size		temperature
• varnishing machine for assemblies	3500 x 2800 x 2400		60° C
• varnishing machine for assemblies	6000 x 5600 x 2300		60° C
• bath	3000 x 1700 x 500		60° C
• varnishing machine	19000 x 16000 x 7000		60° C
• varnishing machine	30000 x 4900 x 5000		20 - 60° C
• varnishing machine	8000 x 6000 x 2400		
• varnishing machine	3000 x 3000 x 2000		80° C
	3000 x 2000 x 2400		80° C
	6000 x 3000 x 2200		80° C
• varnishing machine	4000 x 700 x 1400		80° C
	5000 x 3800 x 2000		80° C
	2500 x 1800 x 850		250° C

Measuring and testing equipment

Equipment	mounting table ø	working range	remarks
• ultra sonic test ALSTOM US-1000		4300 x 1850 x 1800	
• ultra sonic test Cegelec US-2006		12000 x 3000 x 3000	
• 3-D measuring machine Wenzel CMM LH 2015	1500	1500 x 4000 x 1200	max. weight 1500 kg
• 3-D measuring machine Wenzel CMM LH 2015	1500	1500 x 4000 x 1200	max. weight 1500 kg

Production plant Oberpfaffenhofen

Riveting

Equipment	working range (mm)	shaft RPM	rotation A/C	remarks
• Pressure Bulkhead riveting machine Brötje	4000 x 4300 x 1000		-10°/+90° -200°/+200°	
• C_Frame riveting machine Brötje	4150 x 1900	300-15000		
• C_Frame riveting machine Brötje	4150 x 1900			
• IPAC riveting machine (Integrated Panel Assembly Cell) Brötje	11530 x 3400	300-18000		17 rivets per minute

• IPAC riveting machine (Integrated Panel Assembly Cell) Brötje	11530 x 3400	300-18000	17 rivets per minute
• IPAC riveting machine (Integrated Panel Assembly Cell) Brötje	11530 x 3400	300-18000	up to 17 rivets per minute with electric drill (suitable for fiber composite)
• robot cell KUKA KR350/2	cell: 9200 x 8740 range: 2535mm		for blind rivet ø 3,2 und 4,1mm
• rivet filling system Brötje			2 pcs. for Brötje
• Tool presetter Zoller Saturn 1s			presetting of the drilling tools

Suface treatment

Equipment	working range (mm)	temperature	remarks
• enameling line assemblies	30000 x 5000 x 4900	20-60° C	
• varnishing cabin (2 pcs. hall 310)	8000 x 6000	20-60° C	
• sealant mixing system Reindhardt-Technik			tow-component mixing and dosing machine

Inspection and measurement

Equipment	working range (mm)	remarks
• optical measuring instrument MAH MarVision MS 2VT	X 250mm Y 200mm Z 150mm	table load up to 10kg portable table measuring instrument with optical sensor

laboratory for polished specimen

Equipment	working range (mm)	U/Min	remarks
• Bühler metal cutting machine PowerMet 3000	450 x 310	1400	cutting capacity up to ø 105mm
• grind- and plishing machine Bühler Phoenix 4000 cold mounting machine Technomat		150	machining up to 12 polished specimen simultaneously. For gap-free hardening Methylmetacrylat-cold mounting consumables

Our corporate philosophy is customer-oriented. We see ourselves as a partner for integrated solutions from product and system development to industrial scale production. Our core competencies include processing, forming, surface treatment, assembly and disposal technologies. The know-how acquired over several decades is applied to products and systems for the mechanical engineering, automotive, wind power and semiconductor industries. The aerostructures business unit supplies notable aircraft manufacturers worldwide.

Quality and the environment

RUAG Technology's quality management system is certified according to the DIN EN ISO 9001 and ISO/TS 16949 international standards.

In order to protect the environment in a sustainable manner, RUAG Technology attaches great importance to the optimal use of resources and environmentally-friendly practices. To that end, we are committed to complying with the DIN EN ISO 14001 international standard.

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Business units

Automotive



Mechanical Engineering



Coatings



Environment



Aerostructures



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