



## **Machinelijst**

Hierbij bieden wij u een overzicht van de beschikbare machines aan. Alle machines alsmede alle meetmiddelen worden overeenkomstig het ISO 9001 systeem periodiek gekalibreerd. Alle lijsten zijn opgesteld in de Engelse taal, een vertaling van de gebruikte termen vindt u op de laatste pagina's.



## **Machinelist**

Herewith we like to inform you about our machinery. All machines as well as all measuring-instruments, are periodically calibrated according to the ISO 9001 system.



## **Maschinenübersicht**

Anbei finden Sie unsere Maschinenübersicht. Alle Maschinen sowie alle Messgeräte werden nach ISO 9001 System periodisch kalibriert. Eine Übersetzung der gebrauchten Ausdrücke finden Sie auf den letzten Seiten.

# CNC Machining Center

Manufacturer	Heller <b>(productioncentre)</b>	Matsuura Cublex	Matsuura
Model	MC25	Cublex 42	3A III F
Number	3 Machiningcentres	2	1
Range x-axis	800 mm	520 mm	760 mm
Range y-axis	800 mm	730 mm	440 mm
Range z-axis	800 mm	510 mm	485 mm
Clamping surface	500x630 mm	300x3000 mm	800x400 mm
Flatness	0,005	0,002	0,01
Positioning accuracy	0,003	0,002	0,005
Power	30 kW	26 kW	7,5 kW
Rotational speed	45-16000 r.p.m.	60-20000 r.p.m.	40-8000 r.p.m.
Number of tools	160	320	40
Number of pallets	2	40	2
Positioning accuracy pallets	0,003	0,002	0,005
4th-axis	Heller	5 axe Matsuura	None
TURNING C-AXIS	-	1800 rpm	-
Cooland thru spindle	60 bar	70 bar	20 bar
Clamping tools	HSK63A	HSK63A	BT40
Control system	Siemens 840 D	Siemens 840 D	Yasnac I80
Remarks	<b>Multipallet production centre</b>  <b>Automatized by robot, 120 pallet locations</b>	<b>Multipallet production centre</b>  <b>Automatized by robot, 80 pallet locations (Q2 2012)</b>	

# CNC Machining Center

Manufacturer	Matsuura	Hermle	Brother
Model	MC-760 VX	C40	TC 324
Number	1	1	1
Range x-axis	760 mm	850 mm	420 mm
Range y-axis	440 mm	700 mm	300 mm
Range z-axis	485 mm	500 mm	250 mm
Clamping surface	1150x410 mm	1070x700 mm	500x300 mm
Flatness	0,02	0,02	0,005
Positioning accuracy	0,005	0,005	0,003
Power	7,5 kW	15 Kw	4,9 kW
Rotational speed	30-6000 r.p.m.	20-18000 r.p.m.	10-10000 r.p.m.
Number of tools	20	38	10
Number of pallets	none	None	2
Positioning accuracy pallets	d.n.a.	d.n.a.	0,005
4th-axis	Tsudakoma Ø300 mm	Hermle Ø315 mm	none
	(1x) CNC	(1x) CNC	
Coolant thru spindle	none	80 bar	none
Clamping tools	BT40	HSKA63	BT30
Control system	Fanuc OMB	Siemens 840D	TC 324
Remarks			

# Precision CNC Machining Center

Manufacturer	Hembrug
Model	Nano-Focus 425
Number	1
Range x-axis	500 mm
Range y-axis	500 mm
Range z-axis	350 mm
Clamping surface	400 x 400 mm
Max. Weight	45 kg incl pallet
Flatness	0,001 mm / 150 mm
Positioning accuracy	0,001 mm / 150 mm
Repeat accuracy	+/- 0,0002 mm
Run out A-axis	
Power	15 kW
Rotational speed	200- 36000 r.p.m.
Number of tools	28
Number of pallets	one
Positioning accuracy pallets	d.n.a.
A-Axis	130 (-20 / + 90/ +20)
C-Axis	160 R/Min
Coolant thru spindle	none
Clamping tools	HSK 50 E
Control system	Siemens 840D
Remarks	-Resolution 0,01 um -5-assige machine

# CNC Turning

	Manufacturer	Mori Seiki	Spinner	Mori Seiki	Hitachi-Seiki	Cazeneuve
	Model	SL-253MC	TS-46MC	ZL-200SMC Twinspindel	Hicell CA-20	HB-900
	Number	1	2	1	1	1
Main spindle	Max. clamping diameter	Ø260mm	Ø170mm	Ø210mm	Ø210mm	Ø860mm
Main spindle	Standard turning diameter	Ø250mm	Ø200mm	Ø210mm	Ø210mm	Ø600mm
Main spindle	Max. turning diameter	Ø390mm	Ø400mm	Ø390mm	Ø400mm	Ø860mm
Main spindle	Power spindle	15kW	14kW	11kW	11kW	22kW
Main spindle	Rotational speed spindle	3500	5000	4000	5000	2850
Sub spindle	Max. clamping diameter			Ø170mm		
Sub spindle	Standard turning diameter			Ø170mm		
Sub spindle	Max. turning diameter			Ø240mm		
Sub spindle	Power spindle			7.5kW		
Sub spindle	Rotational speed spindle			4000		
	Max. turning length	485mm	500mm	300mm	500mm	2700mm
	Tail stock	Ja	Ja		Ja	Ja
	Accuracy	0.001	0.001mm	0.001mm	0.001mm	0.003mm
	Repeatability	0.002	0.002mm	0.002mm	0.002mm	0.005mm
	Range X-as	235mm	240mm	235mm	215mm	400mm
	Range Z-as	495mm	640mm	500mm	530mm	2705mm
	Range Y-as				100mm(±50mm)	
	Number of Tools	12	12	22	22	4
	Number of driven tools	12	12	12	17	
	Power rotary tools	6.5kW	9kW	6.5kW	3.7kW	
	Rotational speed rotary tools	3000	4000	3000	3000	
	Automation		1x barfeeder max. Ø42mm	barfeeder max. Ø65mm		
	Controle system	Fanuc MSG-501 Mapps I	Fanuc 21iTB Manuel Guide i	Fanuc MSC-501	Seikos L Multi	Somab PL+S3

# CNC Turning

	Manufacturer	Nakamura Tome	Mori Seiki	Mori Seiki	Mori Seiki	Mori Seiki	EMAG
	Model	TW-20 Twinspindel	ZL35A-750	NL-2500Y	NL-2000SY Twinspindel	ZT-2500Y Twinspindel	VSC-250
	Number	1	1	2	1	1	1
Main spindle	Max. clamping diameter	Ø210mm	Ø315mm	Ø260mm	Ø210mm	Ø310mm	Ø260mm
Main spindle	Standard turning diameter	Ø210mm	Ø260mm	Ø275mm	Ø220mm	Ø250mm	Ø260mm
Main spindle	Max. turning diameter	Ø270mm	Ø390mm	Ø356mm	Ø250mm	Ø320mm	Ø280mm
Main spindle	Power spindle	18.5kW	37kW	26kW	18.5kW	22kW	39kW
Main spindle	Rotational speed spindle	5000	3500	4000	5000	4000	6000
Sub spindle	Max. clamping diameter	Ø210mm			Ø170mm	Ø310mm	
Sub spindle	Standard turning diameter	Ø210mm			Ø170mm	Ø250mm	
Sub spindle	Max. turning diameter	Ø270mm			Ø200mm	Ø320mm	
Sub spindle	Power spindle	18.5kW			11kW	22kW	
Sub spindle	Rotational speed spindle	5000			6000	4000	
	Max. turning length	190mm	780mm	705mm	510mm	350mm	150mm
	Tail stock		Ja	Ja			
	Accuracy	0.001mm	0.002mm	0.001mm	0.001mm	0.001mm	0.001mm
	Repeatability	0.002mm	0.002mm	0.002mm	0.002mm	0.002mm	0.002mm
	Range X-as	375mm	225mm	260mm	260mm	280mm	685mm
	Range Z-as	190mm	855mm	795mm	590mm	960mm	200mm
	Range Y-as			100mm (±50mm)	100m (±50mm)	140mm (±70mm)	
	Number of Tools	24	22	12	16(32)	24(48)	12
	Number of driven tools	24		12	16(32)	24(48)	12
	Power rotary tools	3.7kW		5.5kW	5.5kW	4.7kW	9kW
	Rotational speed rotary tools	3000		6000	6000	4000	6000
	Automation		Promot Liniar pick and place unit		Barfeeder Max.Ø65mm  Pick and place unit with Fanuc robot (juli 2010)		Pick and place unit, parts Ø40- Ø205mm with max. length of 150mm
	Controle system	Luck Bei	Fanuc 15 TT-F	Fanuc MSX- 850III MappsIII	Fanuc MSX- 850III MappsIII	Fanuc MSG- 501 MAPPSIII	Siemens 840D Shop turn

# CNC Turning

	Manufacturer	Mori Seiki	Mori Seiki
	Model	NZ2000T2Y2	NZ2000T3Y2
	Number	2	1
Main spindle	Max. clamping diameter	Ø65mm	Ø215mm
Main spindle	Standard turning diameter	Ø65mm	Ø200mm
Main spindle	Max. turning diameter	Ø65mm	Ø320mm
Main spindle	Power spindle	22kW	22kW
Main spindle	Rotational speed spindle	5000	5000
Sub spindle	Max. clamping diameter	Ø42mm	Ø215mm
Sub spindle	Standard turning diameter	Ø65mm	Ø200mm
Sub spindle	Max. turning diameter	Ø65mm	Ø320mm
Sub spindle	Power spindle	22kW	22kW
Sub spindle	Rotational speed spindle	5000	5000
	Max. turning length	260mm	260mm
	Tail stock	No	No
	Accuracy	0.001mm	0.001mm
	Repeatability	0.002mm	0.002mm
	Range X-as	210mm	210mm
	Range Z-as	810mm	810mm
	Range Y-as	110mm (±55mm)	110mm (±55mm)
	Number of Tools	32(64)	48(64)
	Number of driven tools	32(64)	48(64)
	Power rotary tools	7.5kW	7.5kW
	Rotational speed rotary tools	6000/12000	6000/12000
	Automation	Barfeeder max.Ø65mm	Cellro skidbased robotcel with Fanuc M-710 iC robot (aug. 2010)
	Controle system	Fanuc MSG 701 MAPPS IV	Fanuc MSG 701 MAPPS IV

# Precision CNC Turning

	Manufacturer	Hembrug	Hembrug	Hembrug	Schaublin	Schaublin
	Model	Slantbed Microturn 100 CNC	Slantbed Microturn 100 CNC	Slantbed Microturn 100 CNC	125-CNC	180-CNC
	Number	1	1	1	1	1
Main spindle	Max. clamping diameter	Ø130mm	Ø130mm	Ø150mm	Ø100mm	Ø250mm
Main spindle	Standard turning diameter	Ø150mm	Ø150mm	Ø150mm	Ø100mm	Ø250mm
Main spindle	Max. turning diameter	Ø310mm	Ø310mm(Ø110mm)	Ø450mm	Ø150mm	Ø320mm
Main spindle	Power spindle	7.5kW	7.5kW	7.5kW	7.5kW	18.5kW
Main spindle	Rotational speed spindle	6000	6000	4000	5000	5000
	Max. turning length	350mm	350mm	350mm	400mm	650mm
	Tail stock	no	Ja	no	Ja	Ja
	Accuracy	0.0001mm	0.0001mm	0.0001mm	0.001mm	0.001mm
	Repeatability	0.0001mm	0.0001mm	0.0001mm	0.001mm	0.002mm
	Range X-as	200mm	200mm	240mm	180mm	240mm
	Range Z-as	350mm	350mm	350mm	400mm	650mm
	Range Y-as					
	Number of Tools	8	12	12	6	8
	Number of driven tools	8	6	6		
	Power rotary tools	2.5kW	2.5kW	2,5 KW		
	Rotational speed rotary tools	6000	6000	6000		
	Automation					
	Controle system	Siemens 840D Shop Turn	Siemens 840D Shop Turn	Siemens 840D sl (Slimline)	Fanuc 20T	Fanuc 18iT



# Conventional Turning

Manufacturer	Weiler	Amutio
Model	Primus VC	725 F
Number	1	1
Maximum clamping diameter	140 mm	350 mm
Max. diameter	280 mm	670 mm
Distance between centers	500 mm	1500 mm
Power	4 kW	18 kW
Rotational speed	30- 4000r.p.m.	16-1250 r.p.m.
Range x-axis	120 mm	250 mm
Range z-axis	500 mm	1500 mm
Repeatability	0,005	0,01
Remarks	-	-

# CNC Milling

Manufacturer	Hermle	Hermle	Bridgeport
Model	UWF 902 S	C 800V	Interact 4
Number	1	1	1
Range x-axis	600 mm	800 mm	760 mm
Range y-axis	450 mm	600 mm	370 mm
Range z-axis	500 mm	500 mm	335 mm
Clamping surface	650x395 mm	1000x560 mm	965x381 mm
Flatness	0,01	0,01	0,02
Positioning accuracy	0,01	0,008	0,01
Power	8,5 kW	15 kW	7,5 kW
Rotational speed	20-6300 r.p.m.	20-8000 r.p.m.	40-4000 r.p.m.
4th-axis	Table 30°/45°/360°	None	Jones & Shipman Ø 200 mm (1x)
Clamping tools	BT40	SK40	BT40
Remarks	Control system Heidenhain TNC 426	Control system Heidenhain TNC 430	Control system Heidenhain TNC 2500

# Grinding

Manufacturer	Okamoto	Hahn & Kolb	Cincinatti
Model	ACC 63 DX	WS 54	Monoset
Number	1	1	1
Range x-axis	750	d.n.a.	d.n.a.
Range y-axis	340	d.n.a.	d.n.a.
Range z-axis	320	d.n.a.	d.n.a.
Magnet	600x300 mm	d.n.a.	d.n.a.
Distance between centers	d.n.a.	280 mm	152 mm
Maximum grinding length	d.n.a.	110 mm	146 mm
Maximum grinding diameter	355 mm	150 mm	32 mm
Power	3,7 kW	0,75 kW	2,5 kW
Rotational speed	1500 r.p.m.	7100 r.p.m.	6000 + 8000 r.p.m.
Remarks	Surface grinder machine	Cylindrical grinding machine	Cylindrical grinding machine

# NC Tapping

Manufacturer	Kuhne	Kuhne	Microtap II
Model	PIII	GII	90
Number	1	1	4
Rotational speed	200-2000 r.p.m.	200-1350 r.p.m.	30-2200 r.p.m.
Range	M1-M8	M1-M6	M2,5-M12
Clamping surface	200x200 mm	200x200 mm	200x200 mm
Range height	160 mm	160 mm	400 mm
Spindel travel	40 mm	40 mm	53 mm
Remarks	-	-	-

# Sawing

Manufacturer	Kasto	Kasto
Model	HBA 420 AU	SSB A2
Number	1	1
Saw range round	360 mm	260 mm
Saw range square	360x380 mm	260x260 mm
Single feed distance	600 mm	600 mm
Multiple feed distance	1800 mm	5400 mm
Multiple	3	9
Power	6 kW	6 kW
Remarks	Fully automatically	Fully automatically

# Workshop

Machine type: Spark erosion machine  
Manufacturer: Waldman Power: 0,5 kW  
Model: ER-1500-TG  
Number: 1  
Range: Ø 2 - Ø10 mm

Remarks: -

Machine type: Grit blaster  
Manufacturer: MHG Depth: 660 mm  
Model: SMG 54 Height: 550-700 mm  
Number: 1  
Width: 1100 mm

Remarks: -

Machine type: Broaching machine  
Manufacturer: Euma  
Model: EHP-13 HE  
Number: 1  
Capacity: 13 ton

Remarks: Hydraulic

Machine type: Slotting machine  
Manufacturer: URPE Height: 365-525 mm  
Model: M200G Table size: 650x220 mm  
Number: 1 Range x-axis: 435 mm  
Range: 0-200 mm Range y-axis: 235 mm

Remarks: -

Machine type: Honing machine  
Manufacturer: Sunnen Power: 0,37 kW  
Model: MBB 1660 Accuracy: 0,001 mm  
Number: 1  
Range: 6-65 mm

Remarks: -

# Workshop

Machine type: Welding equipment  
Manufacturer: Lorch  
Model: SH 250  
Number: 1

Remarks: CO2

Machine type: Welding equipment  
Manufacturer: Argon-Arc  
Model: Miga Tronic MTE  
Number: 1  
Power: 12 kW

Remarks: TIG en Electrode

Machine type: Rolling barrel  
Manufacturer: Cetema  
Model: R185 EC  
Number: 1  
Capacity: 115 litre  
Power: 3,2 kW

Remarks: -

Machine type: Rolling barrel  
Manufacturer: Cetema  
Model: SDD 185G  
Number: 1  
Capacity: 115 litre  
Power: 3,2 kW

Remarks: -

Machine type: Rolling barrel  
Manufacturer: Cetema  
Model: Minigrinder 04  
Number: 1  
Power: 2,2 kW

Remarks: -

# Workshop

Machine type:	Engraving machine	Height:	250 mm
Manufacturer:	Gravograph	Range x-axis:	150 mm
Model:	1S 200	Range y-axis:	150 mm
Number:	1		
Range:	Ø0,1 - Ø2 mm		

Remarks: -

Machine type:	Lepping & polishing machine
Manufacturer:	Kemet Europe
Model:	15E
Number:	1
Range:	Ø380 mm

Remarks: -

Machine type:	Lasapparatuur
Manufacturer:	Migatron
Model:	
Number:	

Remarks:

# Measuring Room

Machine type:	3D-measuring machine	Range z-axis:	605 mm
Manufacturer:	Mitutoyo	electronic feeler:	PH 10 MQ
Model:	Legex 9106	Accuracy:	0,45 $\mu\text{m}$ + $1.0 \times 10^{-6}l$ (l= in meters)
Number:	1	Computer:	Dell
Range x-axis:	910 mm	Software:	Mcosmos-versie 3.2 + Measurlink (SPC) + Scanpak
Range y-axis:	1010 mm		
Machine type:	3D-measuring machine	Range z-axis:	405 mm
Manufacturer:	Mitutoyo	electronic feeler:	PH 10M
Model:	Crysta-Apex C544	Accuracy:	1.9 $\mu\text{m}$ + $3.0 \times 10^{-6}l$ (l= in meters)
Number:	1	Computer:	Dell
Range x-axis:	505 mm	Software:	Mcosmos-versie 3.2 + Measurlink (SPC)
Range y-axis:	405 mm		
Machine type:	3D-measuring machine	Range z-axis:	400 mm
Manufacturer:	Mitutoyo	electronic feeler:	R-007
Model:	Euro-C 544	Accuracy:	3.0 $\mu\text{m}$ + $4.0 \times 10^{-6}l$ (l= in meters)
Number:	1	Computer:	Dell
Range x-axis:	500 mm	Software:	Mcosmos-versie 3.2 + Measurlink (SPC)
Range y-axis:	400 mm		
Machine type:	3D-measuring machine	Range z-axis:	600 mm
Manufacturer:	Mitutoyo	electronic feeler:	PH 10M
Model:	Euro-C 9106	Accuracy:	4.0 $\mu\text{m}$ + $4.0 \times 10^{-6}l$ (l= in meters)
Number:	1	Computer:	Dell
Range x-axis:	900 mm	Software:	Mcosmos-versie 3.2 + Measurlink (SPC)
Range y-axis:	1000 mm		
Machine-type:	Roundness gauge	Max diameter	$\varnothing$ 300 mm
Manufacturer:	Mitutoyo	Rotation accuracy	0,4 $\mu\text{m}$ + 6l/10000 $\mu\text{m}$ (l in mm)
Model:	RA426	Column Parallelism	3 $\mu\text{m}$ / 200 mm
Number:	1	Column Straightness	0.5 $\mu\text{m}$ /200 mm
Machine-type:	Roundness gauge	Max diameter	$\varnothing$ 300mm
Manufacturer:	Mitutoyo	Rotational accuracy	0,020 $\mu\text{m}$ + 3.5l/10000 $\mu\text{m}$ (l in mm)
Model:	RA/2200CNC	Column Parallelism	0.7 $\mu\text{m}$ /300 mm
Number:	1	Column Straightness	0.15 $\mu\text{m}$ /300 mm
Machine type:	Contracer		
Manufacturer:	Mitutoyo		
Model:	CV/3200S8 CNC		
Number:	1		
Range:	Measuring range 200 mm, height range 300 mm		
Accuracy:	X axis 0.8 + 0.02L $\mu\text{m}$ / Z axis 1.6 + 2H/100 $\mu\text{m}$ (l in mm)		

Note: Measuring room is temperature and humidity controlled.

# Measuring Room

Machine type: Contracer  
Manufacturer: Mahr  
Model: Perthen CV200  
Number: 1

Machine type: Linear measuring apparatus  
Manufacturer: Trimos  
Model: Alesta 300  
Number: 1  
Range: 300mm  
Repeatability: < 1  $\mu\text{m}$   
Max. permissible error:  $1.5 + L \text{ (mm)}/ 300 \mu\text{m}$

Machine type: Profile projector  
Manufacturer: Mitutoyo  
Model: PJ 300  
Number: 1

Machine type: Profile projector  
Manufacturer: Baty  
Model: R14  
Number: 1

Machine type: Endoskope  
Manufacturer: Storz  
Model: 81482  
Number: 1

Machine type: Electronic height gauge  
Manufacturer: Trimos  
Model: Vectra 600 Touch  
Number: 1  
Range: 600 mm  
Repeatability: 1  $\mu\text{m}$

Machine type: Electronic height gauge  
Manufacturer: Trimos  
Model: V600+  
Number: 4  
Range: 600 mm  
Repeatability: 2  $\mu\text{m}$

Machine type: Electronic height gauge  
Manufacturer: Trimos  
Model: V300+  
Number: 4  
Range: 300mm  
Repeatability: 2  $\mu\text{m}$

Machine type: Electronic height gauge  
Manufacturer: Trimos  
Model: TV500  
Number: 1  
Range: 500 mm  
Repeatability: 5  $\mu\text{m}$

Machine type: Electronic roughness meter  
Manufacturer: Mitutoyo  
Model: Surftest SJ401  
Number: 1



Machine type: Electronic roughness meter  
Manufacturer: Taylor Hobson  
Model: Surftronic Duo  
Number: 1

## Workpreparation

Machine type: Programming  
Manufacturer: Top Solid - Proxia Tool data management  
Model: V4  
Number: 1  
Remarks: All CNC-machines can be programmed OF-Line

Machine type: Toolsetting  
Manufacturer: Zoller                      Range x-axis:              400 mm  
Model: Venturion 500              Range y-axis:              500 mm  
Number: 1  
Remarks: Pre setting of tools

Machine type: Toolsetting  
Manufacturer: Zoller                      Range x-axis:              400 mm  
Model: Magix 425D                  Range y-axis:              500 mm  
Number: 1  
Remarks: Pre setting of tools

Machine type: Toolsetting  
Manufacturer: Zoller                      Range x-axis:              400 mm  
Model: Premium V/011              Range y-axis:              320 mm  
Number: 1  
Remarks:

## Vertaling

### Algemeen

Merk  
Type  
Aantal  
Vermogen  
Toerental  
Bereik  
Bereik x-as  
Bereik y-as  
Bereik z-as  
Opmerkingen

### CNC Bewerkingscentrum

Spanvlak  
Vlakheid  
Positioneernauwkeurigheid  
Aantal gereedschappen  
Aantal pallets  
Positioneernauwk. Pallets  
4<sup>e</sup>-as  
Spindelkoeling  
Opname gereedschappen  
Besturing

### CNC Draaien

Maximale spandiameter  
Max. diameter  
Lengte tussen centers  
Nauwkeurigheid  
Aantal gereedschappen  
Aantal gedreven gereedschappen  
Repeteer nauwkeurigheid

### Conventioneel Frezen

Spanvlak  
Vlakheid  
Positioneernauwkeurigheid  
Opname gereedschappen  
Digitale uitlezing

### Boren

Spanvlak  
Spindelslag  
Positioneernauwkeurigheid  
Opname gereedschappen  
Kolomboormachine  
Bereik hoogte

### CNC Frezen

Spanvlak  
Vlakheid  
Positioneernauwkeurigheid  
4<sup>e</sup>-as  
Opname gereedschappen

### Conventioneel Draaien

Max. spandiameter  
Max. diameter boven bed  
Lengte tussen centers  
Repeteer nauwkeurigheid

### Slijpen

Magneet

## Translation

### General

Manufacturer  
Model  
Number  
Power  
Rotational speed  
Range  
Range x-axis  
Range y-axis  
Range z-axis  
Remarks

### CNC Machining center

Clamping surface  
Flatness  
Positioning accuracy  
Number of tools  
Number of pallets  
Positioning accuracy pallets  
4<sup>th</sup>-axis  
Spindle cooler  
Clamping tools  
Control system

### CNC Turning

Max. clamping diameter  
Max. diameter  
Distance between centers  
Accuracy  
Number of tools  
Number of driven tools  
Repeatability

### Conventional Milling

Clamping surface  
Flatness  
Positioning accuracy  
Clamping tools  
Digital read out

### Drilling

Clamping surface  
Spindle travel  
Positioning accuracy  
Clamping tools  
Pillar drilling machine  
Range vertical

### CNC Milling

Clamping surface  
Flatness  
Positioning accuracy  
4<sup>th</sup>-axis  
Clamping tools

### Conventional Turning

Max. clamping diameter  
Max. diameter  
Distance between centers  
Repeatability

### Grinding

Magnet

## Überetzung

### Allgemein

Marke  
Modell  
Zahl  
Motorleistung  
Drehzahl  
Bereich  
Arbeitsbereich x  
Arbeitsbereich y  
Arbeitsbereich z  
Bemerkungen

### CNC Bearbeitungszentrum

Spannfläche  
Flachheit  
Positionsgenauigkeit  
Anzahl Werkzeuge  
Anzahl Paletten  
Positionsgenauigkeit Paletten  
4<sup>e</sup>-Achse  
Spindelkühlung  
Werkzeugaufname  
Steuerung

### CNC Drehen

Max. Spanndurchmesser  
Max. Durchmesser  
Länge zwischen Spitzen  
Genauigkeit  
Anzahl Werkzeuge  
Anzahl angetriebene Werkzeuge  
Genauigkeit

### Konventioneller Fräsen

Spannfläche  
Flachheit  
Positionsgenauigkeit  
Werkzeugaufname  
Digital auslesen

### Bohren

Spannfläche  
Spindelschlag  
Positionsgenauigkeit  
Werkzeugaufname  
Ständerbohrmaschine  
Bereich Höhe

### CNC Fräsen

Spannfläche  
Flachheit  
Positionsgenauigkeit  
4<sup>e</sup>-Achse  
Werkzeugaufname

### Konventionelles Drehen

Max. Spanndurchmesser  
Max. Durchmesser  
Länge zwischen Spitzen  
Genauigkeit

### Schleifen

Magnet

Centerafstand  
Max. slijplengte  
Max. slijpdiameter  
Vlakslijpmachine  
Rondslijpmachine  
Gereedschapsslijpmachine

#### **NC Tappen**

Spanvlak  
Slag

#### **Zagen**

Zaagbereik rond  
Zaagbereik vierkant  
Aanvoerlengte enkelvoudig  
Aanvoerlengte meervoudig  
Aantal meervoudig  
Afkortzaag

#### **Prototype werkplaats**

Spanvlak  
Max. spandiameter  
Max. diameter boven bed  
Max. slijpdiameter  
Lengte tussen centers  
Vlakheid  
Positioneernauwkeurigheid  
Aantal gereedschappen  
Aantal gedreven gereedschappen  
Opname gereedschappen  
Aantal pallets  
Positioneernauwk. Pallets  
4<sup>e</sup>-as  
Slag  
Spindelkoeling  
Opname gereedschappen  
Besturing  
Vlakslijpmachine  
Gereedschapsslijpmachine

#### **Plaatwerk**

Besturing  
Maximale plaatgrootte  
Maximale plaatdikte  
Vrije ruimte  
Maximale drukkracht  
Aantal gereedschappen  
Nauwkeurigheid  
Lasersnijmachine  
Ponsnibbelmachine  
Kantbank  
Ponsbank  
Klinkmachine  
Roestvrijstaal  
Plaatschaar  
Schuurmachine

#### **Werkplaats**

Breedte  
Diepte  
Hoogte  
Capaciteit  
Nauwkeurigheid  
Straalcabine  
Trommelmachine

Distance between centers  
Max. grinding length  
Max. grinding diameter  
Surface grinder  
Cylindrical grinding machine  
Tool grinder

#### **NC Tapping**

Clamping surface  
Spindle travel

#### **Sawing**

Saw range round  
Saw range square  
Single feed distance  
Multiple feed distance  
Multiple  
Cross-cut saw

#### **Prototyping**

Clamping surface  
Max. clamping diameter  
Max. diameter  
Max. grinding diameter  
Distance between centers  
Flatness  
Positioning accuracy  
Number of tools  
Number of driven tools  
Clamping tools  
Number of pallets  
Positioning accuracy pallets  
4<sup>th</sup>-axis  
Spindle travel  
Spindle cooler  
Clamping tools  
Control system  
Surface grinder  
Tool grinder

#### **Sheet-metal**

Control system  
Max. size  
Max. thickness  
Free space  
Max. pressure  
Number of tools  
Accuracy  
Laser cutter  
Punching machine  
Folding machine  
Punching machine  
Rivetting machine  
Stainless-steel  
Sheet metal shears  
Sanding machine

#### **Workshop**

Width  
Depth  
Height  
Capacity  
Accuracy  
Grit blaster  
Rolling barrel

Abstand zwischen den Spitzen  
Max. Länge  
Max. Durchmesser  
Flächenschleifer  
Rundschleifmaschine  
Werkzeugschleifmaschine

#### **NC Gewindeschneiden**

Spannfläche  
Spindelschlag

#### **Sägen**

Bereich rund  
Bereich viereckig  
Länge in der Einzahl  
Länge in der Mehrzahl  
Mehrzahl  
Quersäge

#### **Prototyp Schlosserei**

Spannfläche  
Max. Spanndurchmesser  
Max. Durchmesser  
Max. Durchmesser  
Länge zwischen Spitzen  
Flachheit  
Positionsgenauigkeit  
Anzahl Werkzeuge  
Anzahl angetriebene Werkzeuge  
Werkzeugaufname  
Anzahl Paletten  
Positionsgenauigkeit Paletten  
4<sup>e</sup>-Achse  
Spindelschlag  
Spindelkühlung  
Werkzeugaufname  
Steuerung  
Flächenschleifer  
Werkzeugschleifmaschine

#### **Blechbearbeitung**

Steuerung  
Max. Größe  
Max. Dicke  
Freie Räume  
Max. Druckkraft  
Anzahl Werkzeuge  
Genauigkeit  
Laserschneider  
Lochnippel machine  
Biegebank  
Lochstanzte  
Nietbank  
Rostfreiem Stahl  
Blechscherer  
Sandpapiermaschine

#### **Schlosserei**

Breite  
Tiefe  
Höhe  
Leistungsvermögen  
Genauigkeit  
Sandstrahler  
Putztrommel

Lasapparaat  
Puntlasmachine  
Hoonmachine  
Spoelmachine  
Pompvermogen  
Verwarming  
Deuropening

**Meetkamer**

Elektronische taster  
Nauwkeurigheid  
Luchtvochtigheid  
3D-meetmachine  
Profiel projector  
Elektronische hoogtemeter  
Elektronische ruwheidsmeter  
Hardheidsmeter  
Laagdiktemeter  
Vergroting  
Lengte meetbank

**Werkvoorbereiding**

Programmeer afdeling  
Gereedschappen beheer

Welding equipment  
Spot welding machine  
Honing machine  
Rinsing machine  
Pump capacity  
Heater  
Doorway

**Measuring room**

Electronic feeler  
Accuracy  
Humidity  
3D-measuring machine  
Profile projector  
Electronic height gauge  
Electronic roughness meter  
Hardness gauge  
Layer thickness meter  
Enlargement  
Linear measuring apparatus

**Workpreparation**

Programming  
Toolsetting

Schweißgerät  
Punktschweißmaschine  
Honmaschine  
Spülmaschine  
Pumpenleistung  
Heizanlage  
Türöffnung

**Meßraum**

Elektronische Abtaster  
Genauigkeit  
Humidität  
3D-Meßmaschine  
Profil Projektor  
Elektronisches Höhenmeßgerät  
Elektronisches Rauheitsmeßgerät  
Härtemesser  
Schichtdickemesser  
Vergrößerung  
Längenmeßgerät

**Arbeitsvorbereitung**

Programmierung  
Werkzeugmagazin