



Available Machinery

GRINDING

1 CAD-Master

Elb, MS1a

Surface grinding machine
with profile dresser for diamond rolls
CNC-control 6 axes, NC-dressing

Grinding length:	600 mm	23.62 inch
Grinding width:	350 mm	13.78 inch
Diameter of disks:	500 mm	19.69 inch



1 Powerline 1207

ABA, MS1a

Surface grinding machine
with profile dresser for diamond rolls
CNC-control

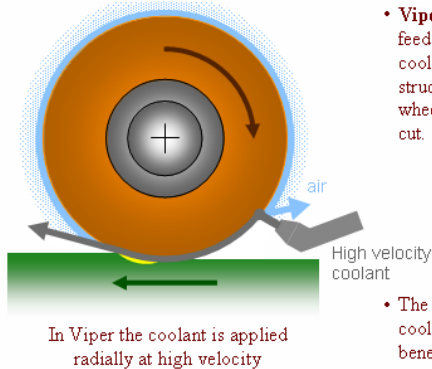
Grinding length:	1250 mm	49.21 inch
Grinding width:	600 mm	23.62 inch
Grinding height:	700 mm	27.56 inch





2 Viper Grinding Machines

Makino



- **Viper-grinding**; a new method of creep-feed grinding using high-pressure coolant directed radially into an open-structured aluminium-oxide grinding wheel at a position close to the point-of-cut.

- With **Viper-grinding** the coolant is forced through the air-barrier and into the surface of the wheel.

- The application of the high velocity coolant provides a number of significant benefits.



1 Surface Grinding Machines (AC 10)

Elb

with profile dresser for diamond rolls
CNC-control 3 axes, NC-dressing

Grinding length:	1000 mm	39.37 inch
Grinding width:	400 mm	15.75 inch
Grinding height:	500 mm	19.68 inch
Diameter of disks:	500 mm	19.68 inch

2 Surface Grinding Machines (micro cut 6 and 10)

Elb

with profile dresser for diamond rolls
CNC-control 3 axes, NC-dressing

Grinding length:	600 - 1000 mm	23.62 – 39.37 inch
Grinding width:	400 mm	15.75 inch
Grinding height:	300-400 mm	11.81 - 15.75 inch
Diameter of disks:	400-500 mm	11.81 – 15.75 inch

1 Surface Grinding Machines (MPF 80)

Mägerle

with profile dresser for diamond rolls
CNC-control 3 axes, NC-dressing

Grinding length:	800 mm	31.50 inch
Grinding width:	450 mm	17.71 inch
Grinding height:	350 mm	13.78 inch
Diameter of disks:	500 mm	19.68 inch



1 Surface Grinding Machines (Profimat MC-607)

Blohm

with profile dresser for diamond rolls

CNC-control 3 axes, NC-dressing

Grinding length: 700 mm 27.56 inch

Grinding width: 520 mm 20.47 inch

Grinding height: 550 mm 21.65 inch

Diameter of disks: 400/500 mm 15,75 inch/19.68 inch



8 Surface Grinding Machines:

Mägerle/Elb, MS2

with profile dresser for diamond rolls

Grinding length: 800-1000 mm 31,50 – 39.37 inch

Grinding width: -300 mm -11,81 inch

Diameter of disks: 400 mm 15,75 inch

2 Special Grinding Machines

Elb

for outer diameter

with profile dresser for diamond rolls

Grinding diameter: 350-505 mm 13,78 – 19.87 inch

Grinding width -100 mm - 3,94 inch

4 Special Grinding Machines

Elb

for inner diameter

with profile dresser for diamond rolls

Grinding diameter: 400-500 mm 15,75 - 19,69 inch



3 Double-Disk Grinding Machines

Bach

for universal grinding of square workpieces

Dimensions:	Length x	Width x	Height
	120 x	50 x	40 mm
	5,91 x	1,97 x	1,57 inch

with semi-automatic workpiece feeding

Diameter of disk:	600 mm	23,62 inch
-------------------	--------	------------

2 Belt Grinding Machines SMF 350-F

Stahl

performance: 3 kW, 2880 rpm, 50 Hz

840 rpm min

3100 rpm max.



55 Working Places for Manual Grinding

Metabo

Manual labour



MILLING

1 Machining Center Deckel DC 55-2

Deckel, MS1

Operating range: (X-Y-Z)
1000 x 800 x 800 mm / 39,37 x 31,50 x 31,50 inch
Tool holder: ISO 50
Tool magazine: 40
CNC-circular table enforced to 7000 Nm clamped to 8000 Nm
Palet changer
Palet dimensions: 630 x 630 mm
Weight of workpiece: 1500 kg
Power of spindle: approx. 27 kW



9 Machining Centers MC 600

Maho, MS1b/2

Operating range: (X-Y-Z)
600 x 450 x 495 mm / 23,62 x 17,72 x 19,49 inch
Tool holder: ISO 40
Tool magazines: 24
NC-circular table
Palet changer
Palet dimensions: 500 x 500 mm / 19,69 x 19,69 inch
Weight of workpiece: 300 kg / 661,39 lbs.
Power: approx. 8 kW



1 Machining Center BZ 26

Steinel, MS1b

Operating range: (X-Y-Z)
800 x 500 x 500 mm / 31,50 x 19,69 x 19,69 inch
Palet dimensions: 500 x 500 mm / 19,69 x 19,69 inch
Tool holder: ISO 50
Tool magazine: 60
NC-circular table
Spindle power 28 kW (100 %)



8 Machining Centers CWK400

Heckert, MS1b

Operating range: (X-Y-Z)
650 mm x 500 mm x 650 mm
Palet dimensions: 400 x 500 mm
Tool holder: SK40
Tool magazine: 60
NC-table
Spindle power 35 kW at 335 Nm





- 2 Hermle UWF 902W** **Hermle, ECM**
High Speed cutting 40.000 RPM
Operating range: (X-Y-Z)
600 x 450 x 500 mm / 23,62 x 17,72 x 19,49 inch
4 axes, profile tolerance + 0,006
Total power: 8 kW
- 2 Bedplate milling machines with CNC-control** **Heller, MS1/2**
Vertical and horizontal
Operating range: X 1250 mm / 49,21 inch
Y 560 mm / 22,05 inch
Spindle cone ISO 50
Table load 2500 kg / 5511,59 lbs.
- 3 Universal Milling and Drilling Machines** **Maho, MS1a/4**
CNC-control, with and without NC-circular table
Operating range: X 500 mm / 19,69 inch
Y 380 mm / 14,96 inch
Z 350 mm / 13,78 inch
Spindle cone: ISO 40
- 1 Universal Milling Machine** **Maho**
CNC-control, with NC-circular table (B-Axis)
Operating range: X 800 mm / 31,50 inch
Y 500 mm / 19,69 inch
Z 600 mm / 23,62 inch
Spindle cone ISO 40
- 1 3-Spindle – 5 Axes - Milling Machine** **Hessapp, MS1**
Bedplate milling machine, with 3 vertical spindles
Rotation and swing table (4th and 5th axis)
Milling device for milling of airfoil profiles
Total length of blade 400 mm / 15,75 inch (3 spindles)
Milling of Blisks (Blade and disk) up to a diameter of 500 mm / 19,69 inch
Operating range: X 520 mm / 20,47 inch
Y 500 mm / 19,69 inch
Z 500 mm / 19,69 inch
Spindle cone ISO 50
Tool changer for 3 x 8 tools
Power per spindle 14 kW
-



2 Liechti Turbomill 1200

1 spindle, 5-axis

Operating range:

X 1800 mm / 70,87 inch
Y 400 mm / 15,75 inch
Z 300 mm / 11,81 inch
A revolving 360 °
B + 50° 28 RPM

spindle 44 kW / 16.000 RPM

Tool changer:

32 tools

Spindle cone

HSK-63A

Liechti, MS1



1 Liechti Turbomill 1200

1 spindle, 5-axis

Operating range:

X 1800 mm / 70,87 inch
Y 400 mm / 15,75 inch
Z 300 mm / 11,81 inch
A revolving 360 °
B + 50° 28 RPM

spindle 30 kW / 24.000 RPM

Tool changer:

14 tools

Spindle cone

HSK-63A

Liechti



3 Liechti G-Mill 550 (Blisk)

Liechti

1 spindle, 5-axis

Operating range:

X	600 mm / 23,62 inch
Y	600 mm / 23,62 inch
Z	600 mm / 23,62 inch
A	revolving 360°
B	+70° /-250°

spindle 22 kW / 15.000 RPM

Tool changer:

50 tools

Spindle cone

HSK-63A



1 Liechti G-Mill 850 (Blisk)

Liechti

1 spindle, 5-axis

Operating range:

X	799 mm / 31.49 inch
Y	799 mm / 31.49 inch
Z	849 mm / 33.46 inch
A	360° revolving
B	+80° /-260°

spindle 20 kW / 15.000 RPM

Tool changer:

50 tools

Spindle cone

HSK-80A





3 Heckert SX - 051
1 spindle, 5-axes
Operating range:

Heckert, MS1

X	650 mm / 25.60 inch
Y	650 mm / 25.60 inch
Z	650 mm / 25.60 inch
A	revolving 360 °
B	+ 115°/- 40°

spindle 19 kW / 15.000 RPM
Tool changer:

60 tools



Various conventional production milling machines ISO 40 and ISO 50





ECM – Electro Chemical Machining

- | | | |
|----|---|--------------|
| 3 | Electrochemical Machines
up to 10.000 Amp.
3 axes CNC-control | AEG Elotherm |
| 10 | Electrochemical Machines
up to 20.000 Amp.
3 axes CNC-Control | Leistriz |
| 2 | Electrochemical Machine
20.000 Amp.
5 axes - for machining of Blisk
CNC-Control | Leistriz |
| 1 | Electrochemical Machine EC2000
10.000 Amp.
4 axes
CNC-Control | Leistriz |
| 5 | Electrochemical Machines EC2010
20.000 Amp.
5 axes
CNC-Control | Leistriz |





PROCESSING

- 1 **Process-controlled Etching Line with 9 Tanks** **MS4**
max. weight of workpiece 20 kg / 44,09 lbs.
- 1 **Process-controlled Crack Test Equipment (FPI)**
for fluorescent penetration inspection
max. weight of work piece 20 kg / 44,09 lbs.
- 6 **Vibrator and Centrifugal Slide Grinding Machines** **Trowal/Spalek**
for surface improvement of various shaped pieces
max. dimensions 200 x 100 x 50 mm
 7,87 x 3,94 x 1,97 inch
- 3 **Controlled Wet Blasting Machines**
circular table type for compression blasting with
glass balls and corundum
- 1 **Controlled Shot Peening Machines**
for compression shot peening with steel balls

Profile Rolling / Drawing machinery

- 1 **Vacuum Furnace** **Schmetz, SFS**
- 1 **Complete Machining Equipment for Drawn Profiles** **SFS**
5 - hot and cold rolling
3 - draw benches

TOOL PRODUCTION



1	Maho Milling Machine 600 P	Maho, WZN
2	Maho Milling Machine 800 P	Maho
1	Vertical Milling Machine	Wanderer
1	Jig Drilling Machine	Abba
1	Surface Grinding Machines	Elb
1	Surface Grinding Machine	Mägerle
1	Drill-Grinding Machine	Vedewag
1	Bench Lathes (training center)	VDF/Weiler
1	DMU 80	Deckel / Maho
15	Mounting places	



Quality assurance is certified according to:

* ISO 9001; ISO 14001; EN 9100 / AS 9100

* AQAP 1 (complies with NATO-specifications)

* DIN 50049 / 3.1B

1	Universal Coordinate Measuring Machine UMC 850	Zeiss
1	Universal Coordinate Measuring Machine Siro 688	Leitz
1	Universal Coordinate Measuring Machine Contura	Zeiss
1	Universal Coordinate Measuring Machine GLOBAL 574	Leitz
1	Universal Coordinate Measuring Machine GLOBAL 7/10/7	Leitz
1	Laser Vibrometer OFV 3000 for determination of natural frequency of blades	Polytec
12	Computer-controlled multi-point Inspection Devices	
1	Tensile Strength Testing Machine	Zwick
1	Vacuum-Emission Spectrometer	Spectrolab
3	Creep Strength Testing Machines	
2	Vibratory Testing Machine for HCF-Testing	
3	Equipments for magnetic particle inspection	
	Various microscopes for metallographical tests	Leitz

end