

## PRODUCT OVERVIEW

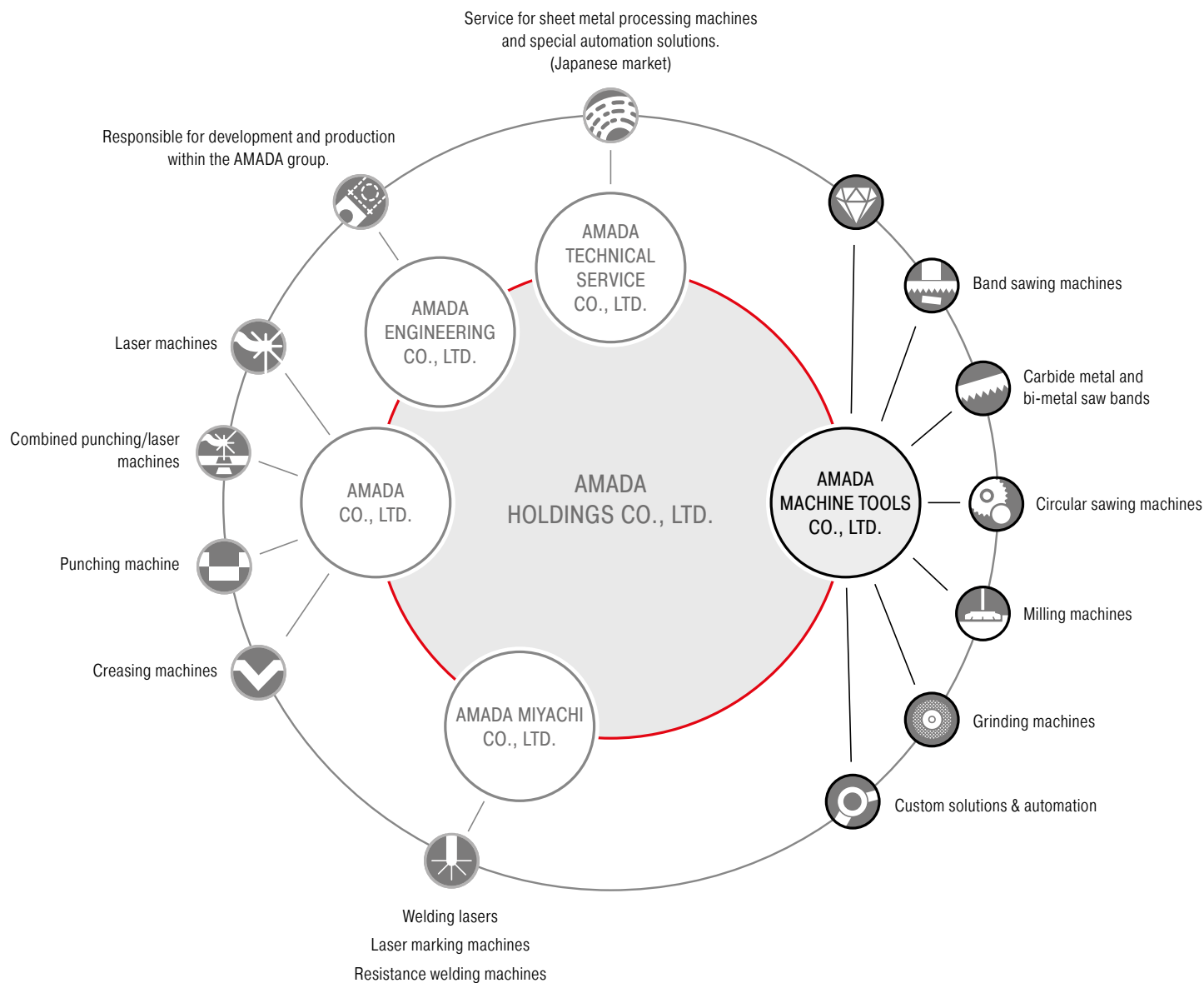
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### GRINDING TECHNOLOGY

# AMADA GROUP

- 9250 employees
- Turnover of 2.7 billion €
- 91 companies worldwide

(Last updated March 31th 2019)





European Headquarters and Technical Centre in Germany



Technical Centre in France



Technical Centre in Italy



AMADA MACHINE TOOLS EUROPE

## GRINDING TECHNOLOGY

As a world market leader for optical profile grinding and high-precision surface and profile grinding, AMADA stands for the successful fusion of well-established brands such as WASINO Grinding Technology, Profiltec, Doebeli, and PeTeWe. This merger has opened up new dimensions of grinding technology. By combining Japanese and European cutting-edge technologies, innovative and user-oriented solutions of the highest economic efficiency and productivity can be realised.

## SAWING TECHNOLOGY

AMADA is a manufacturer of sawing machines and band saw blades. This unique advantage leads to constant development of new and optimised products. Our aim is to always offer the most economically beneficial solution. The AMADA plant in Ternitz, Austria develops and produces primarily carbide metal and bi-metal saw bands for the European market.

## MILLING TECHNOLOGY

AMADA milling machines for efficient machining of sheet materials have proved of value in the tool steel industry and with suppliers in the mechanical engineering, automotive and aerospace sectors. AMADA offers highly productive double-head milling machines for 4-sided machining and machines with particularly large milling heads for machining the surface of sheets with a large width and length in one or only few machining steps.



Company headquarters in Japan (Isehara)



High-tech development centre near Mount Fuji Fujinomiya Works



## AMADA GROUP

### LEADING MANUFACTURER OF MACHINE TOOLS

Founded in 1946 by Mr Isamu AMADA, the AMADA Group now consists of over 90 companies and subsidiaries around the whole globe. AMADA's business objective is primarily the production, sale, repair, maintenance and inspection of metal processing machines and complete machine lines. Where AMADA was initially focused on producing saws, Mr AMADA quickly expanded the company into the field of innovative sheet metal processing machines. Seventy years and more than 3100 patents later, AMADA now has more than 9000 employees worldwide and has earned a global leading position in its product sector.

## AMADA IN EUROPE

With 18 companies in 13 European countries and over 1,500 employees in Europe, AMADA aims to grow as a partner of its European customers and endeavours to offer technologically sophisticated and efficient solutions at all times.

## AMADA MACHINE TOOLS EUROPE

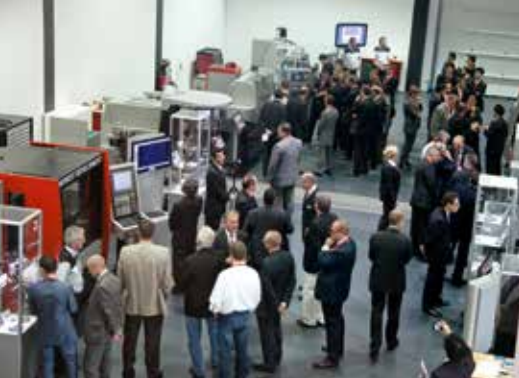
AMADA MACHINE TOOLS EUROPE was established in October 2009 to promote the growth of the grinding and sawing technology sector and to strengthen the company's position in the important European market. Today AMADA MACHINE TOOLS EUROPE is responsible for sawing machines, milling machines, grinding machines and metal sawing bands in Europe, Russia, CIS and Northern Africa. The company organises sales, service, provision of spare parts and application support. In addition to its headquarters in Haan (near Düsseldorf / Germany), AMADA MACHINE TOOLS EUROPE also has locations in France and Italy and an office in Russia. In addition, there is an established network of local partners within the covered regions.

### OPTIONS / AUTOMATION

Even those AMADA machines produced in batch production have the ideal equipment for economic production. But we can increase their efficiency even more by offering customised solutions. These solutions consist of components that have proven themselves in practical applications, so that short-term availability and maximum process reliability is always guaranteed.

### SPARE PARTS / OILS

AMADA Machine Tools operates a central spare part warehouse for Europe in Haan near Düsseldorf, in order to guarantee a quick and efficient spare parts supply. Wear materials and frequently required spare parts are also kept in stock at our locations in Italy and France for local customers. Original AMADA spare parts and operating materials will help you reach maximum reliability.



## SERVICE

AMADA MACHINE TOOLS EUROPE provides tailor-made service support for the complete operating life of your AMADA grinding, milling and sawing machines. Our expert service staff will help you use your machine in the most efficient manner. Our comprehensive service network guarantees fast availability of a service technician and reduced downtimes of your machine tool.

## APPLICATION CONSULTING

AMADA MACHINE TOOLS EUROPE supports its customers throughout the entire product life cycle. In our Technical Centre, we carry out application trials for all technologies, calculate part production times/costs and evaluate the results of our analysis together with our customers.

## TECHNICAL CENTRE

The idea behind the AMADA Technical Centres is the creation of a unique atmosphere for all visitors in which our most recent production technologies can be discussed and demonstrated. Our most recent technologies in each product group are shown "live" in operation. We analyse customer requests and requirements to find the ideal solution together with the customer.

## ENVIRONMENTAL AWARENESS

AMADA has developed a long-term environmental plan "AMADA Green Action" for the promotion and preservation of the environment. In the development of new products, energy efficiency and resource reduction are taken into account. New production facilities, such as the new plant in Toki, are built according to these guidelines and operate under strict compliance with them. Our products represent modern and forward-looking technologies combining productivity, responsibility, competence and vision.



## QUALITY AND ENVIRONMENT MANAGEMENT

Since 1983 AMADA has been monitoring its production based on the "AMADA Group Policy of Quality Insurance", steadily improving all processes in development, production and service. AMADA machines, tools and saw bands are produced in a global network of production facilities in Japan, Europe, USA, China and Taiwan.

ISO certificates: The production centre in Fujinomiya is certified according to ISO 9002, ISO 90001: 2000 and ISO 14001. The remaining production facilities in Japan and Europe are certified according to ISO 9000ff and ISO 14001. In addition, the saw band production in Ternitz / Austria has also installed an environment management system in accordance with EMAS and has the corresponding certification.





# OPTICAL PROFILE GRINDING

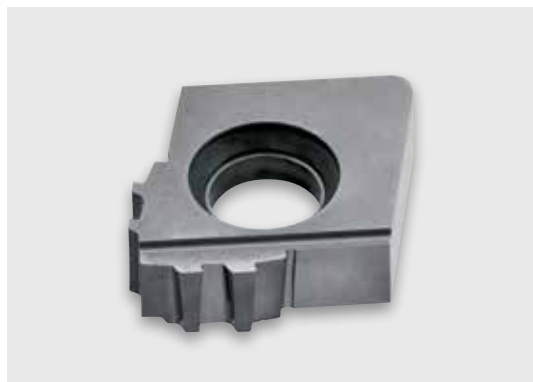
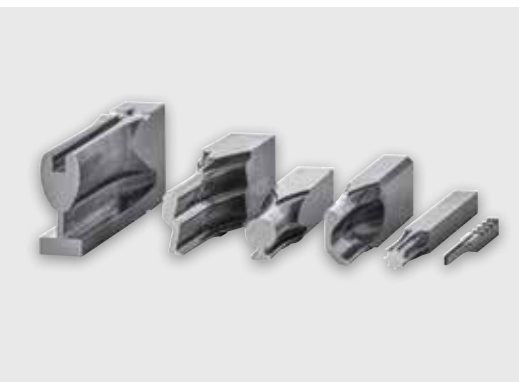


## OPTICAL PROFILE GRINDING

For more than 70 years, AMADA as the global market leader has shown its innovative strength over and over again and has set new standards in machining high-precision components for tool, die and mould production, as well as for manufacturing in general.

### **Main features of AMADA grinding technology**

- High precision thanks to uncompromising mechanical concept
- Designed to machine components made of steel, carbide and ceramics
- Latest projector and CCD-camera-technology
- Fast-stroke systems
- Integrated automation solutions
- External programming software and macro programming
- up to 10 controlled axes



## Optical profile grinding technologies by AMADA

### GLS SERIES

The top-selling optical profile grinding machine in the world with a high-precision projector. Fast implementation of the required tasks through teach-in playback technology. Optimum suitability for small batches, single item production and repairs.



GLS 150 GL UP

### DV1

The fully automated profile grinding centre with CCD-camera technology. With a CCD camera, CAD-based digital data can be memorized and automatically processed. A built-in robot enables fully automated production, i.e. high-precision profiles can be manufactured in small and large batches.



DV1

# GLS SERIES



## GLS SERIES

The GLS 150 GL is the world's leading optical profile grinding machine: Using a projector and a magnifying glass, the grinding area is enlarged by factors up to 100, i.e. 1  $\mu\text{m}$  is visible to the naked eye. Minute details on the workpiece can be recognized at a glance. Once again, the most recent generation of the GLS series excels with maximum quality. Its high stability, ease of operation of the AMADA Fanuc CNC unit and the versatile options for machining even the most complex shapes are all outstanding features.

The latest UP series offers innovative features.



## OPTICAL PROFILE GRINDING

# APPLICATIONS GLS SERIES



Linear motor stroke (UP)



Motorized positioning of wheel head



Automatic swivelling wheel head



Fanuc 15" Touch screen (UP)

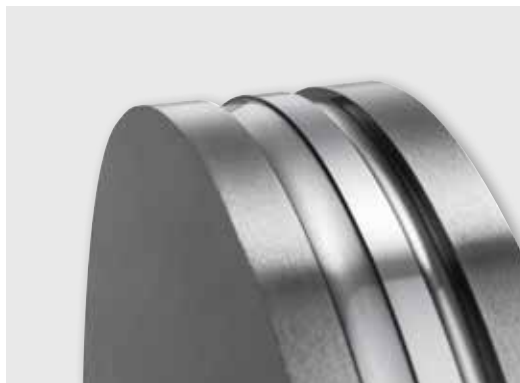


Indexing - axes



Hand wheel for manual operation

UP TO 10 CONTROLLED AXES ALLOW A  
VARIETY OF MACHINING SOLUTIONS ON  
COMPLEX CONTOURS

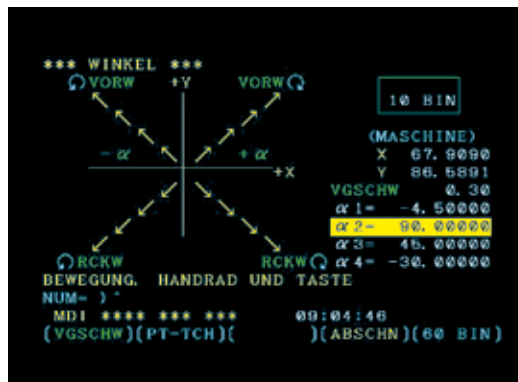


## OPTICAL PROFILE GRINDING

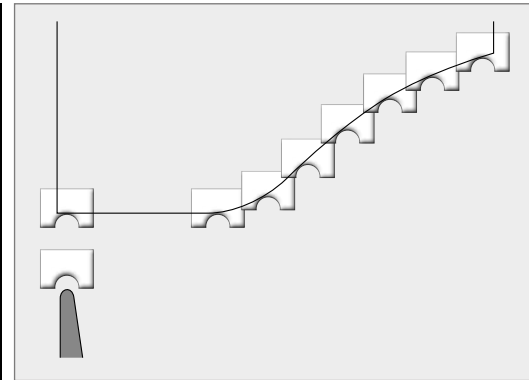
# PROGRAMMING - SETUP - REGRINDING GLS SERIES



External programming



Macro programming, angle and radius dressing



Teach-in-Playback system



Digital SMART system (UP) - up to 1,000 times magnification



CCD-camera verification



Standard magnifying system - up to 100 times



The optical profile grinding machines offer the suitable operating philosophy for each user.

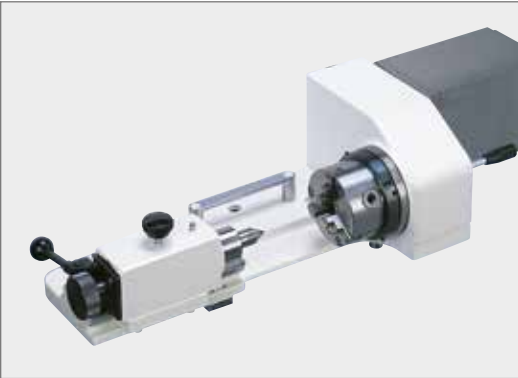
- Manual operation by handwheels
- Teach-in-Playback system
- Macro cycle programming
- External programming system

Permanent control by projector CCD-camera

The operator can select at any time the most relevant type of operation.

## OPTICAL PROFILE GRINDING

# OPTIONAL EQUIPMENT GLS SERIES



Cylindrical grinding unit D 100



Indexer and cylindrical operation function combined



Indexing system



Indexing system in 3 different positions



## OPTIONAL EQUIPMENT

### Cylindrical system

Suitable cylindrical systems can be offered for smaller and larger diameters.

### Dressing system

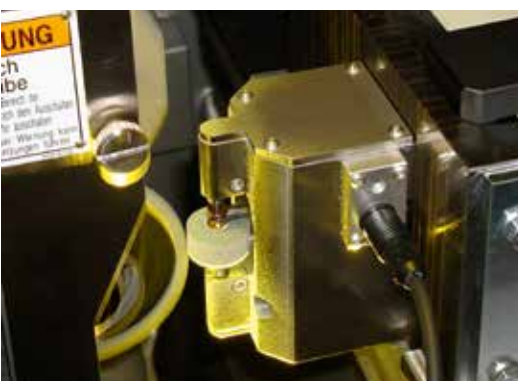
Dressing systems suitable for manual or automatic dressing.

### Indexing and interpolation system

Additional interpolation axes can be offered.

### wet grinding

all optical grinding machines can be equipped with a wet grinding system.



Dresser MRD 180



Automatic dresser GLS UP



Wet grinding

## OPTICAL PROFILE GRINDING

# DV1



## DV1

The AMADA DV-1, which has been awarded with various innovation prizes, opens up groundbreaking possibilities for automated profile grinding. Based on the principle of optical profile grinding, the machine can measure both the workpiece and the grinding wheel using a built-in CCD camera.

The results are then compared with the required dimension. Differences are immediately calculated and the machine regrinds the workpiece to the finish dimension with  $\mu$  accuracy and with the highest surface finish.





CCD camera technology



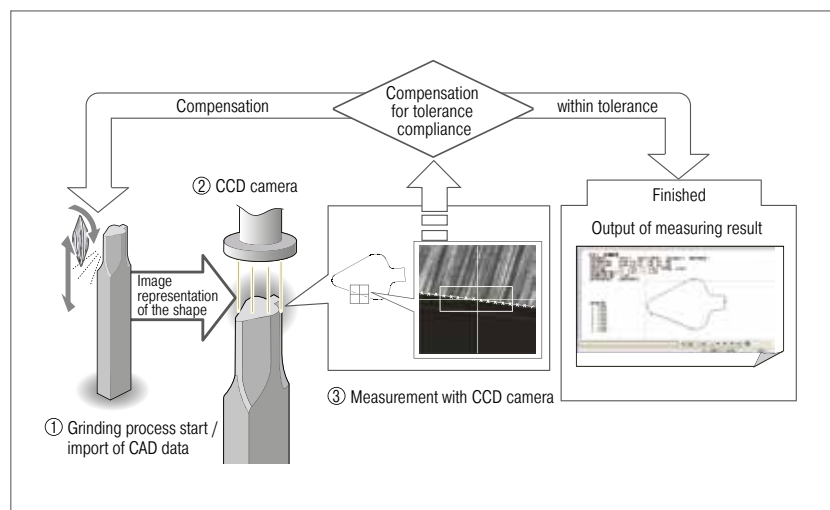
Ultra-precision component



Operation via Windows-based touch screen

## The new technology of the DV-1

Integrated automatic measurement of the workpiece with automatic regrinding for compensation purposes



## Features

- Programming using DXF data
- 360 deg machining of the 4 sides with built-in rotary axis
- Current measuring data acquisition to compile a measurement log
- Minimum radii 0.04mm
- Optimum surface finish Ra 0.03
- Built-in dressing system

# SURFACE AND PROFILE GRINDING



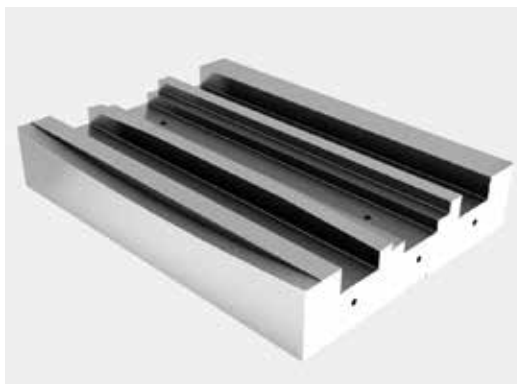
## SURFACE AND PROFILE GRINDING

### **AMADA is growing and expanding its portfolio**

AMADA is investing in advanced technologies and has combined these solutions in its new machine ranges.

- New technologies and machine ranges from 400 x 200 mm to 1,200 x 600 mm
- Maximum precision and surface finish thanks to uncompromising mechanical machine concept
- Fast-stroke system for shorter machining times
- State-of-the-art dressing technology developed in cooperation
- New software solutions giving a new impulse to grinding technology





## Surface and profile grinding technologies by AMADA

### Meister series

The master in universal machines for surface and profile grinding.  
Now available in fully automatic version.



### Techster series

Compact design in a grinding area up to 800 x 400 mm.  
High-precision surface and grinding with a grinding area of up to 1,200 x 600 mm.

The Techster series offers modular expansions up to and including solutions for automation.



## SURFACE AND PROFILE GRINDING

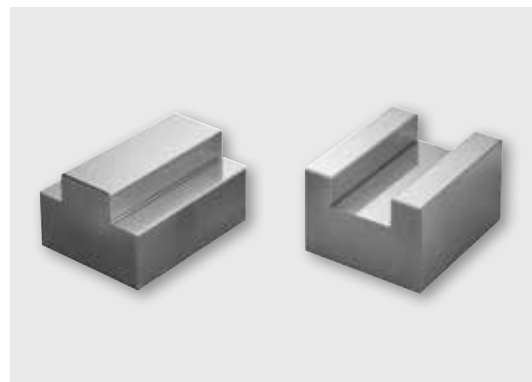
# MEISTER G3 SERIES



## MEISTER G3

The Meister G3 is a multi tool grinder for everyday use capable of completing both simple and complex grinding tasks.

Steel, carbide, ceramics and other materials can be ground in manual mode or in CNC mode. The machines come equipped with dressing and continuous path grinding technology and can be used for surface and profile grinding.



### The universally recognised masterpiece

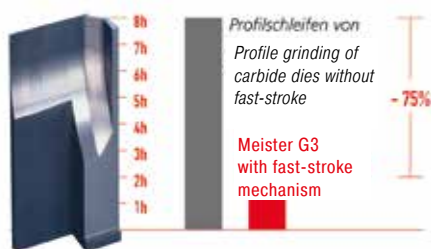
Ultra-precision surface and profile grinding machine with fast-stroke mechanism. Advanced standard equipment including CNC unit, high-precision dressing and continuous path grinding technology for Y and Z axes, spindle and hydraulic cooling, ceramic spindle bearings and full-enclosure.

The control unit of the Meister G3 excels as a unit with optimum operability. Sophisticated macros make programming extremely convenient even for inexperienced CNC users.

An integrated measuring probe mounted on the grinding head measures the workpiece. Residual grinding allowances are automatically calculated and the machine will repeat the grinding cycle in unattended operation until the finish dimension has been reached – quickly and safely. And – that's new – the measuring probe can define the start position of the grinding wheel on the workpiece.

### 4-fold increase of productivity

By way of direct comparison, users analysed the machining time for a pair of mould and die parts made of carbide. Thanks to convenient programming of the AMADA grinding software and the fast-stroke mechanism, time savings of 75% could be reached compared with a CNC profile grinding machine.



## MEISTER G3

### Features

- Grinding area 500 x 200 mm
- High-quality equipment for surface, plunge-cut and continuous path grinding as well as for dressing
- Fast-stroke system
- New dressing technologies
- High-resolution measuring systems with 50 nm accuracy
- Hand-scraped double-V-guideways
- Contour dressing and contour grinding with external programming software
- Integrated measuring probe technology
- 3 separate hand wheels for easy set-up and manual operation
- Integrated coolant system for increased thermal stability
- External Software CGS and WinWOP (option)

SURFACE AND PROFILE GRINDING

# MEISTER G3 SERIES



## MEISTER G3 UP

The Meister G3 UP is AMADA's fully automatised successful model with an integrated Fanuc Robot including a part changer, grinding wheel changer, ball screw with Fanuc fast stroke system as well as an working area raised by 80 mm.

## SURFACE AND PROFILE GRINDING

# OPTIONAL EQUIPMENT MEISTER G3 UP



Automatic wheel changer



Automatic part changer



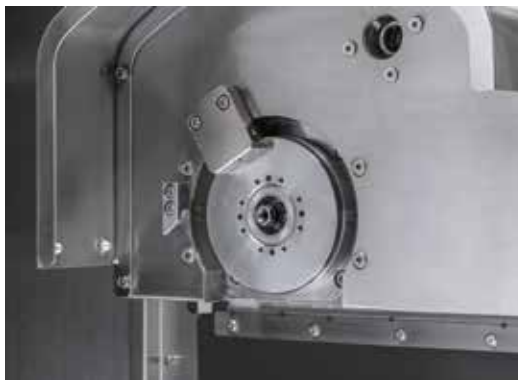
magazine for parts and grinding wheels

## NEW OPTIONAL EQUIPMENT MEISTER G3 UP

- Fanuc Robot for automatic workpiece and grinding wheel change
- 15 station stocking system
- HSK32 spindle with speed up to 10.000 rpm
- Ballscrew table with new Fanuc fast-stroke system
- creep feed grinding and high precision positioning
- New air-sensor-technology for wheel size measuring
- Raise of working height by 80 mm
- Compact foot print - similar to the standard Meister G3



Air-sensor wheel measuring system



Spindle with auto clamp system



Indexing system for 5-side operation

SURFACE AND PROFILE GRINDING

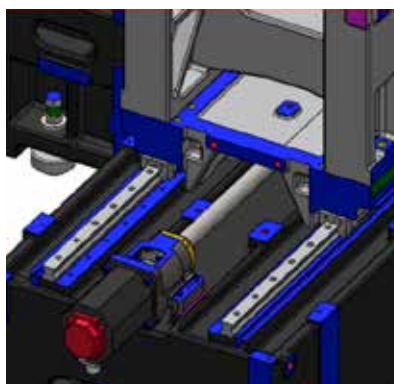
# TECHSTER SERIES



## TECHSTER 84 UND TECHSTER 84H

The compact types of the Techster series.





### Convenient machining of surfaces and long profiles

As with all AMADA surface and profile grinding machines, this series, too, is defined by maximum precision and know-how of craftsmanship. Among other features, the artfully designed hand-scraped double V guides create ideal conditions for machining. In combination with options for profile grinding, automatic measurement and various clamping options, this machine is destined for workshop operation.

### Features

- Grinding area 800 x 400 mm
- C-column reaching all the way under the table
- Guides without overhang, fully supported
- Advanced pivoting dressing systems
- Path contour grinding crosswise and lengthwise
- Hand wheels for each axis and teach-in function
- Automatic measuring probe, contact monitoring
- TECHSTER 84H: extension of the grinding height 200 mm

SURFACE AND PROFILE GRINDING

# TECHSTER SERIES



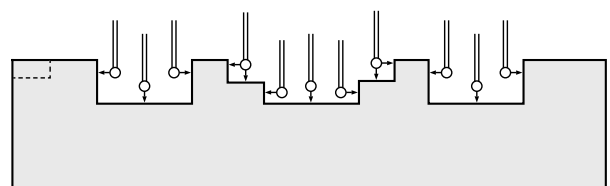
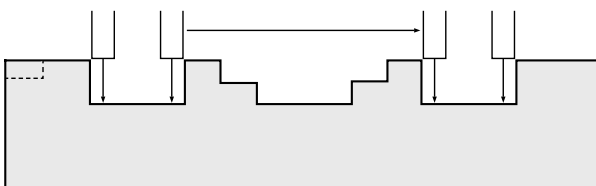
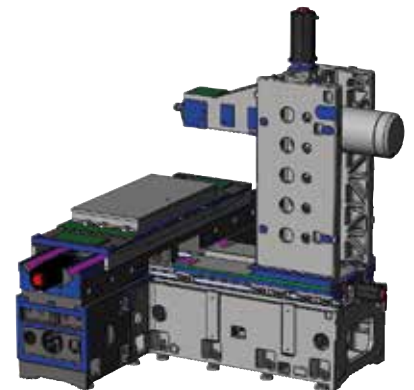
## TECHSTER 104 – 126

The Techster Series impress with their mechanical design and the control concept. The construction is stable and allows precision operations, due to the bridge construction. With servo drives and ball screw technology in all axes, the Techster machine works hydraulically-free and always with the highest accuracy.



## New standards of surface, profile and flute grinding as well as contour grinding

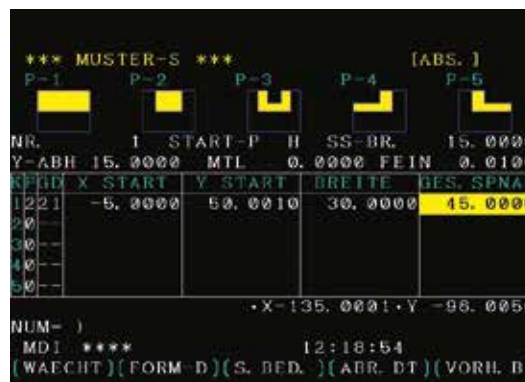
- Grinding area from 800 x 400 to 1,200 x 600 mm
- Highly sturdy bridge-type structure
- Hand scraped double V guides in the longitudinal axis with increased sliding ability
- All axes equipped with ball screw technology
- Table feed rate up to 40m/min
- Ultra-precision measuring system with 0.05 µm resolution
- Integrated measuring probe with compensation function
- 3 separate hand wheels for easy set-up and manual operation
- Large working area for the use of indexing and cylindrical grinding devices
- Contour grinding and dressing
- State-of-the-art dressing technology
- External programming



Integrated measuring probe - measuring with µm precision on the machine

STANDARD

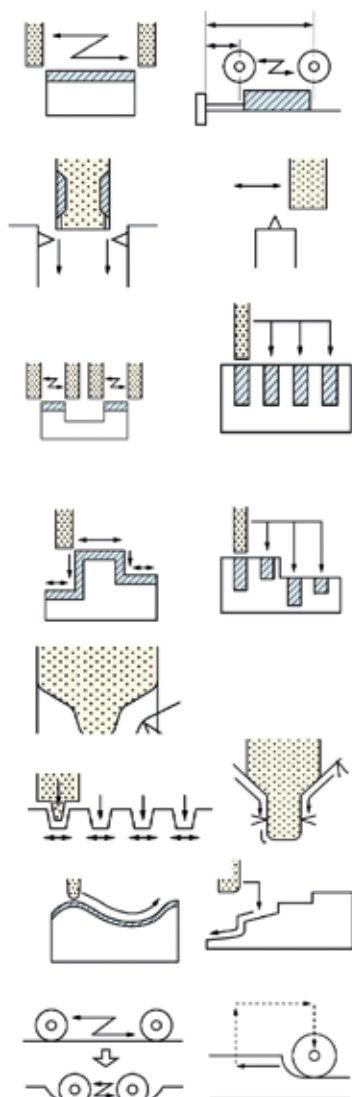
# SOFTWARE | OPERATING LEVEL



Makro-Programmierung



Manuelle Bedienung



Workshop-suitable control function for intuitive surface and plunge-cut grinding using hand wheels, the teach-in function, standard values and technology macros for more options.

## Manual

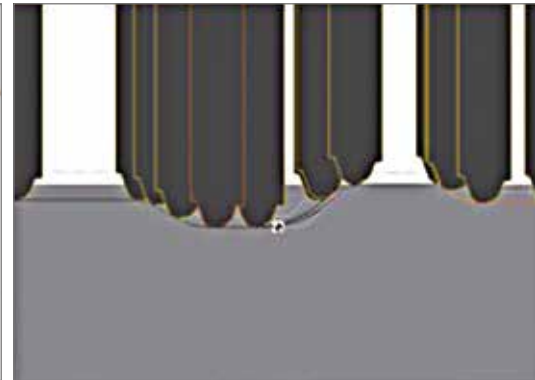
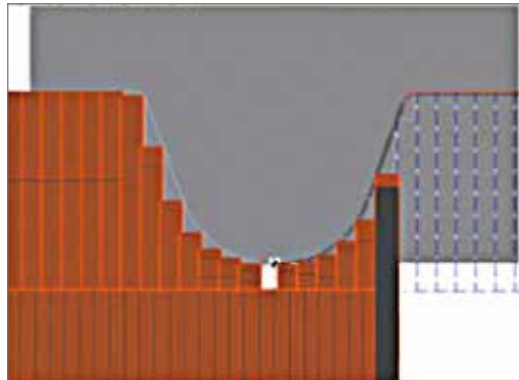
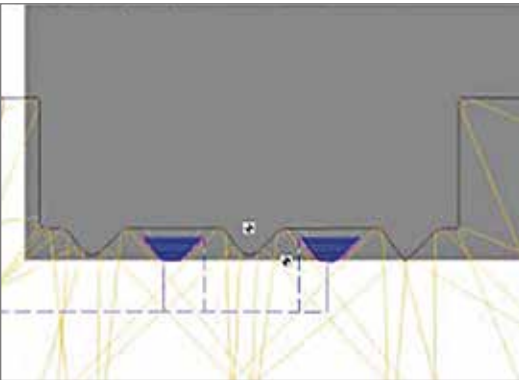
- Surface and plunge-cut grinding
- Set-up with hand wheels for each axis
- Teach-in of switching points
- Standard program for grinding, enter value
- Start grinding

## Grinding technologies

- Flute grinding, division - identical and differing
- Steps
- Grinding pattern
- Dressing
- Path grinding pattern
- Path grinding, profile made of radii, inclines
- Chamfer radius, left-hand - right-hand or left-hand and right-hand

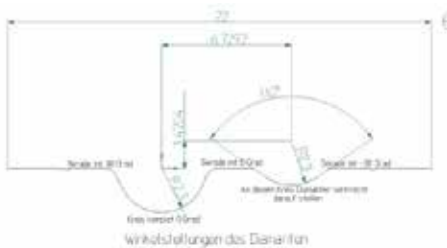
## I OPTIONS

# II. SOFTWARE WINWOP

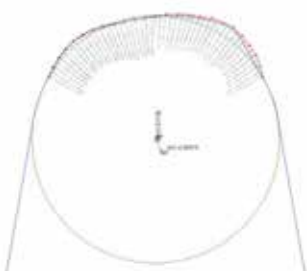


WinWOP screens

Wear compensation  
Corrects alignment errors and diamond wear  
Grinding with  $\mu\text{m}$  accuracy with deformed diamonds



Profiling the grinding wheel



Grinding a test piece  
Measuring with the contourgraph  
Uploading and processing measured data in WinWOP



Simulation and program output with corrected travel paths

WinWOP expands the AMADA menu for complex profiling operation. Based on the Windows interface, the software automatically generates CAD data for path grinding and dressing programs with a pivoting dressing wheel, pre-dresser or dressing stations. Grinding wheels and dressing tools are managed and synchronised by their status.

## Functions

- Uploading CAD data
- Integrated CAD program
- Management of grinding wheels and dressing tools
- Simple operating interface
- Automatic collision monitoring
- Integrated standard geometries
- Suitable for PC or network
- Reprofile of grinding wheels with detection of residual contours
- Automatic wear compensation for degenerated diamond radii
- Job listing for linking several operating sequences
- Programming independent of the machine running time
- Compatible with III. Operating interface, CGS, external programming system

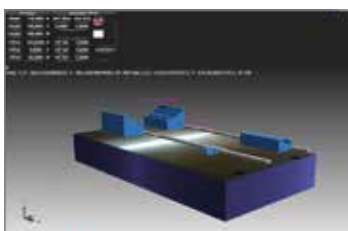
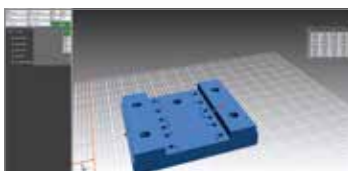
## OPTIONS

# III. SOFTWARE CGS



Multi-clamping in templates,  
Application of 3D data

CGS - Complete Grinding Solution permits complete external programming, including contour programming with WinWOP. Starting with the processing of 3D data, through dressing programs up to complex technologies for machine controls, this system allows you to reduce programming times and increase the automated machine runtime.



### Functions

- Uploading of CAD data, 3D for clamping equipment, unmachined part, machined part
- Integrated WinWOP program
- Management of grinding wheels and dressing tools
- Management of jobs, technology data in one click
- Measurement of unfinished and finished dimension
- Define measuring points with a click in the 3D model
- Multi-clamping with 3D simulation
- Several machining steps per geometry, several geometries (clamping processes ) and overview of overall clamping processes
- Management and integration of well-tested grinding technologies
- Preliminary calculation of the process time and running time output
- Programming independent of the machine running time

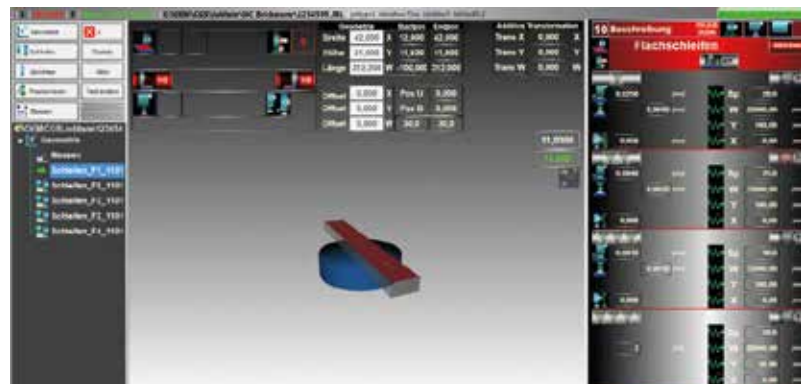


## OPTIONS

# III. SOFTWARE CGS



Start screen



3D import of workpiece on pallet



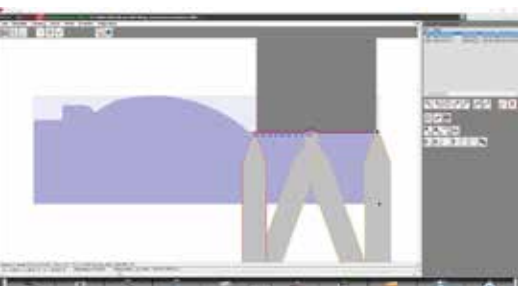
Multi-clamping

CGS offers unlimited programming options and is compatible with external systems for automation, measuring positions or workpiece management for continuous production systems

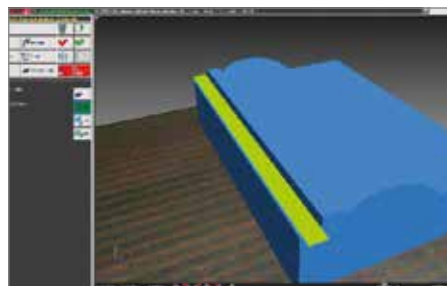
A new approach to classic surface grinding.

Grind different workpieces from batch size 1, clamped in an interchangeable frame or against stops more efficiently than with several surface grinding machines - with no reprogramming required.

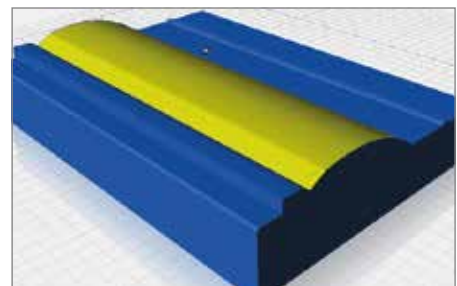
The machining process consists of saved technologies.  
High precision grinding beginning with the lot size 1.



Segmenting of an overall profile (format.dxf) into individual profiles, (format.dxf) suitable for the selected grinding wheel



Complex operations - simply solved with CGS



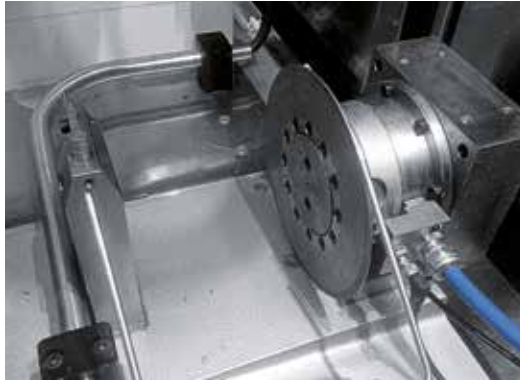
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## OPTIONAL EQUIPMENT

# SURFACE AND PROFILE GRINDING



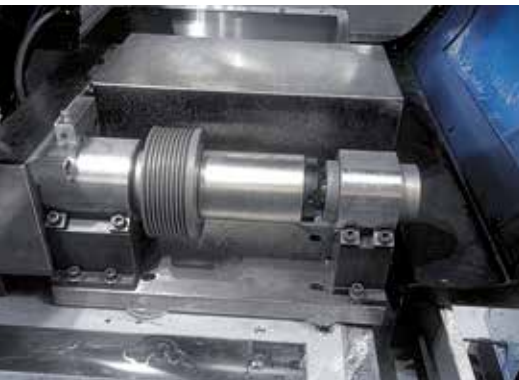
3-point profile dresser G3 with straight dresser



Diamond wheel dresser GWA



Tilting dresser TPA/VPA



Roller dresser ERG



TPA and roller dresser



Dressing with a diamond wheel

## NEW DRESSING TECHNOLOGY

### Compact high-precision profile dressing device

AMADA has developed new dressing solutions for all machine series in cooperation with European partners.

### Very high profile accuracy

- Design with incredible mechanical stability including counter bearing

### Ultra-compact design with optimum weight

- Dressing system can be used for the smallest and the largest machine series.

### Resharpener the diamond wheel without a conversion

- Dressing tools can be resharpener directly on the device:  
High flexibility and low follow-up costs

### Pre and finish profiling

- For pre-profiling, the additional dressing unit VPA is used

### Easy conversion

- Using cassette system

OPTIONAL EQUIPMENT

# SURFACE AND PROFILE GRINDING



Zero-point clamping system



Zero-point clamping system with magnet chuck



Zero-point clamping system with indexing table

## FLEXIBLE CLAMPING SOLUTIONS

**In cooperation with leading European suppliers of clamping systems we always offer you a suitable solution.**

- magnet clamping systems
- vacuum clamping systems
- hydraulic and pneumatic clamping systems
- quick change pallet systems
- zero-point clamping systems

**Integrated with:**

- single or double axes indexing solutions
- automation solutions

## OPTIONAL EQUIPMENT

# SURFACE AND PROFILE GRINDING



Measuring technology



coolant system BIX-T



coolant nozzle system Innozi

## TECHNOLOGY

### MEASURING TECHNOLOGY

- Tactik measuring in all axes directions.
- Modern integrated measuring technology allows on machine measuring with automatic compensation.

### COOLANT SYSTEM BIX-T

The BIX-T coolant system entrances the surface of the coolant and reduce the temperature of the process more effective.

### BALANCING AND GAP CONTROL SYSTEM

Manual and fully-automatic solution for the balancing of the grinding wheel.

AMADA offers advanced grinding solutions through the CGS Software combined with gap-control systems.



Balancing



Touch control



## SURFACE AND PROFILE GRINDING

# ROTARY TABLE GRINDING MACHINE SSR-5



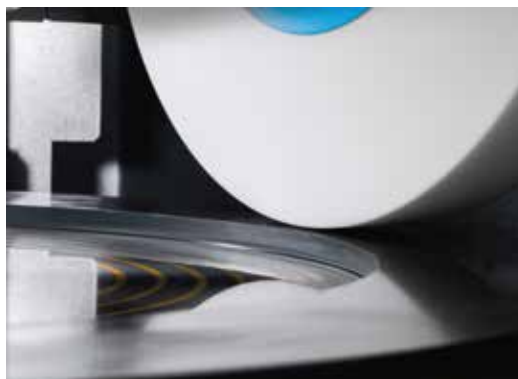
### SSR-5 UP

The AMADA SSR-5 UP Rotary table grinder allows up to 3-times higher productivity compare to a standard surface grinder.

High accuracy combined with a high stock removal.

NC and CNC controlled axes without hydraulic system. The AMADA original software provides optional possibilities for automatic dressing and workpiece measuring.

NC controlled axes	2 axes simultaneously 1 axes controlled
Chuck size (OD)	Ø 508 mm
Travels (Ram/Table)	335 mm/190 mm
Wheel spindle grinding wheel size (OD x Width x Bore)	355 x 38 x 127 mm



# WITNESS TECHNOLOGY IN ACTION



## TECHNOLOGY

### **AMADA Machine Tools Europe – Technology**

AMADA Machine Tools Europe views itself as a contact partner for technical dialogue with customers and other interested parties. Experience grinding and sawing technology live, discuss them with specialists focusing on your demands, generate ideas and take solutions with you when you leave.

The latest machines, precision measuring equipment and related accessories are available to work on ideas and concepts and test them immediately. The Technical Centre is available for individual customer visits and themed events with customers and suppliers. It is the active communication platform for interaction between users, suppliers and developers.







## APPLICATION ENGINEERING

### **AMADA Machine Tools Europe – Application engineering**

AMADA MACHINE TOOLS EUROPE supports its customer throughout the entire investment decision-making process. At our Technical Centre, we calculate job times and we discuss the process analysis results with our customers.



# WITNESS TECHNOLOGY IN ACTION



## GROWING TOGETHER WITH OUR CUSTOMERS

### **Maximum focus on the customers' requirements**

In close cooperation with its customers, AMADA optimises existing technologies and develops new solutions which meet the users' needs and are always one crucial step ahead, ensuring that our customers remain competitive - today and in the future.

### **Proximity to the customers as a primary aim**

As an international group, AMADA has one fundamental desire: To be as close to the customer as possible. The decentralised organisation of our production sites, research and development centres and Solution and Technical Centre ensure that we reach this aim on a global scale.

### **Technology partner**

All over the world, the AMADA group has built up a network of R&D Centres in which advanced application solutions for industrial production are developed. Due to our global network and due to the close cooperation between AMADA Japan, AMADA Europe and European grinding specialists, we can generate new synergies to give our customers new and previously unattainable opportunities.





## AMADA Machine Tools Europe – Service

AMADA MACHINE TOOLS EUROPE provides tailor-made service support for the complete operating life of your grinding and sawing machines.

Our expert service staff will help you use your machine in the most efficient manner. Our comprehensive service network guarantees fast availability of a service technician and reduced downtimes of your machine tool. Our modern storage systems will guarantee the shortest possible delivery times. Use original AMADA MACHINE TOOLS spare parts to reach maximum reliability.





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