AMADA MACHINE TOOLS

Fusion and sublimation of technologies
Quality realized by dedicated manufacturer of grinders

Lineup of grinder

www.amada.com

AMADA®

A manufacturer of machine tools that supports cutting-edge manufacturing

Since starting the manufacturing of profile grinders in 1943, AMADA MACHINE TOOLS has constantly sought higher accuracy and quality as a pioneer in the field.

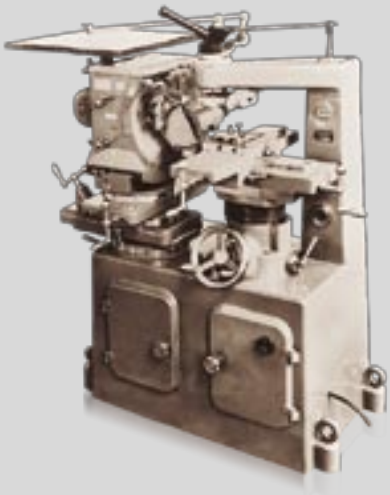
To meet the diversifying needs of technology driven manufacturing, designers visit customers to ensure that the engineered solutions address their needs, quickly and effectively. We are providing customized solutions to meet the specific requirements of customers, adding value to core technologies through integration and enhancement of peripheral equipment.
Since the company's establishment, AMADA MACHINE TOOLS has been highly regarded for its application engineering. We enhance customers' manufacturing through automation, CCD processing and software development enabling world leadership in high accuracy grinding processes and parts miniaturization.

As expected with the high standards of Japanese-made products, we are constantly striving to improve our machine manufacturing in pursuit of excellence. Each machine is built with traditional "scraping". We've implemented the latest equipment and manufacturing systems. Machine design is enhanced using three-dimensional stress analysis. Our well-established machine supply system ensures high cost performance for all our customers. The new plant relocation plan to increase capacity is currently ongoing.

An engineer who provides cutting-edge processing technology with excellent skills

A high level of proficiency that is constantly updated

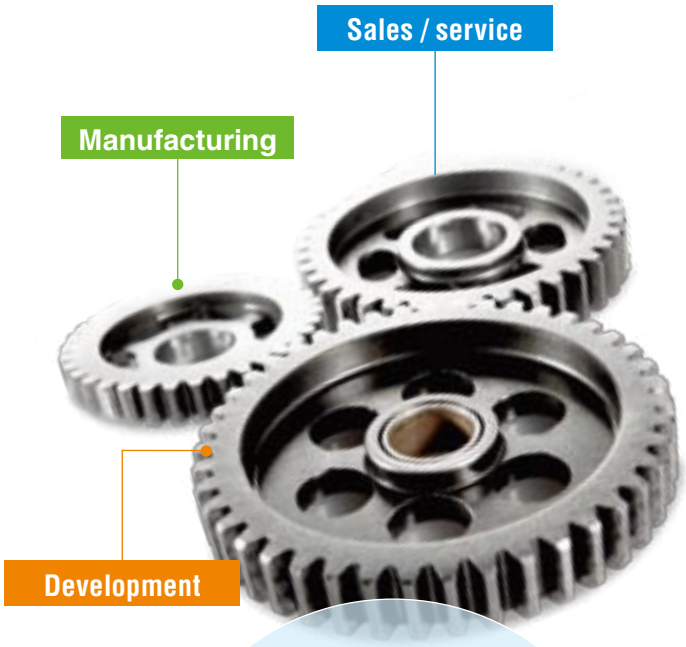
Solution Center where you can find cutting-edge technology



Original profile grinder WSK (1943)

Top selling optical profile grinder GLS-5P

“Quality for quality’s sake” – AMADA MACHINE TOOLS’ constant endeavor to satisfy customers



With customers

Empowered by application engineering, our company has promoted a system for carrying out development, manufacturing, and sales / services. We aim to provide the highest technical capabilities with ease of operability.

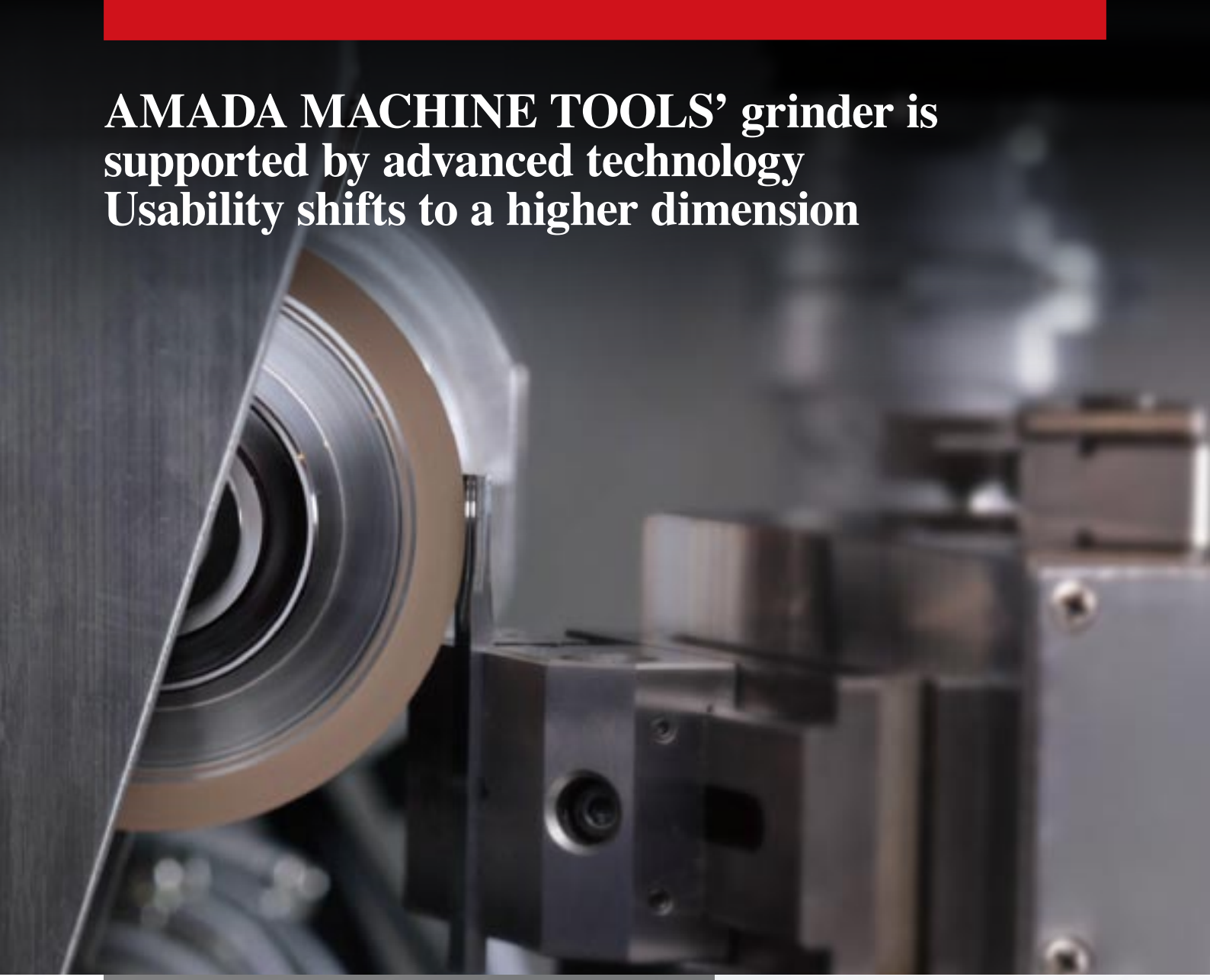
Actual machines can be inspected at the Solution Center to confirm the functions and performance first hand. We also carry out demonstrations in which you can view processes using the actual machines with the help of our engineers. We have four Solution Centers at home and abroad and we aim to carry out further global expansion.
For customers who are being introduced to our product, we have set up the NC School as a prior training facility. In addition to learning how to operate the machinery before introduction, you can learn all about processing technology. Our company’s field engineers are fully qualified to carry out seamless operation support after introduction. The engineers can browse the parts stock / ordering system and visualized manuals anywhere utilizing the latest mobile equipment. We have 11 bases in Japan providing rapid high quality services to support your manufacturing.
AMADA MACHINE TOOLS constantly advances the development, manufacturing, sales, services and customer’s productivity and stable operation.

Manufactured according to strict quality standards

Latest graphical profile grinder DV-1

Top selling forming grinder MS G3

AMADA MACHINE TOOLS' grinder is supported by advanced technology Usability shifts to a higher dimension



1 Optimum balance machine that supports high reciprocating grinding

As a pioneer in high reciprocating grinding processing, we have brought to reality a superb dynamic balance between machine and grindstone condition.
AMADA MACHINE TOOLS' grinder fulfills highest processing demands

AMADA MACHINE TOOLS' grinder meets your precise processing requirements

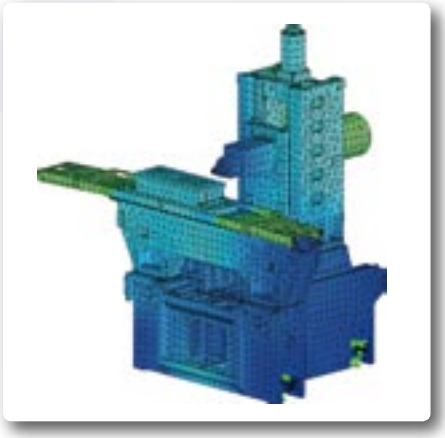
2 High quality grinding surface that exceeds specifications

The accuracy of the grinding and processing surface cannot be represented by Rz only. AMADA MACHINE TOOLS' mark-less and sharp edge mirror grinding is realized.

Sharp edge & mirror finish for a variety of processes

3 Reliable high rigidity technology achieved by three-dimensional design

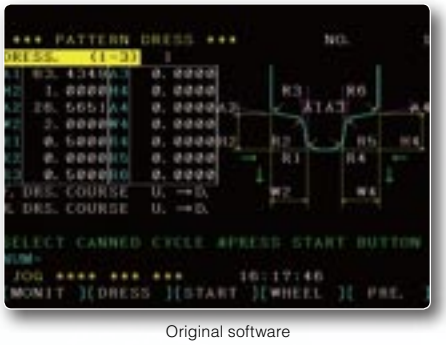
The form of the machine has been developed by advanced three-dimensional design. The machine structure has been finalized through a series of demonstration tests to create high-dimensional rigidity.



CAE structure analysis realized by three-dimensional digital design

4 “Mastery skills” are evolved into software

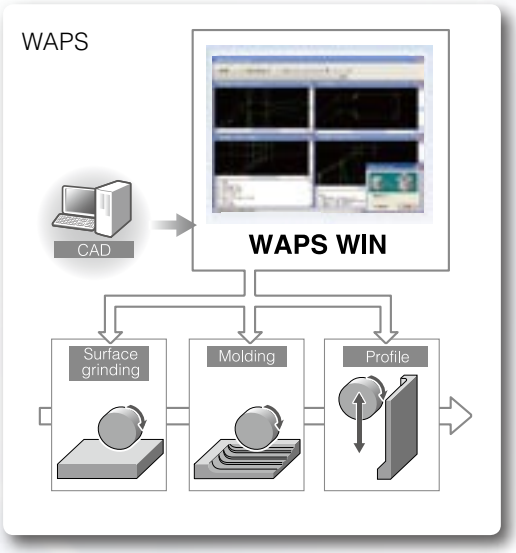
Each model has dedicated software enabling excellent grinding processing technology that supports accurate, efficient grinding processing.



Original software

5 From “surface grinding”, “molding” to “profile”

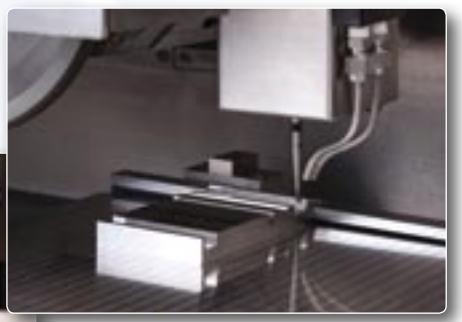
Total grinding system is realized by WAPS,
WAPS is offered only by AMADA MACHINE TOOLS.
It realizes networking of each processing program from rough processing to finishing processing.



Grinding processing is networked by versatile software

6 Original measurement technology on equipment

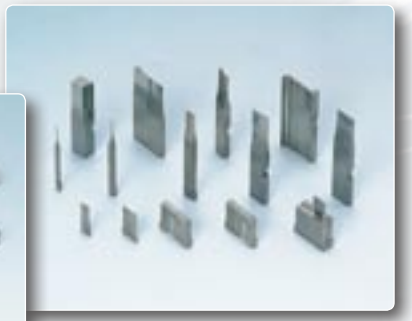
Not as a simple grinding processing machine but as a pioneer of machines on which measurement technology is mounted, we propose further advances.



Measurement on equipment that improves productivity and form accuracy

We solve customers' problems as a comprehensive grinding machine manufacturer.

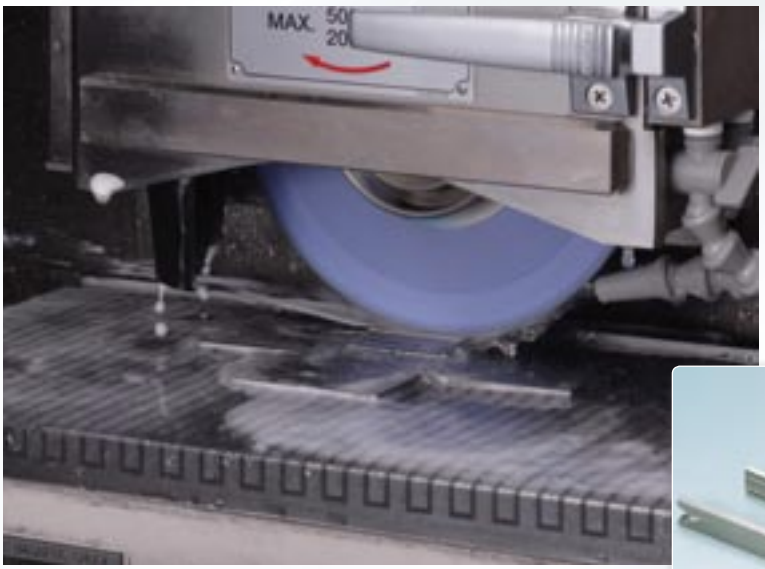
Profile grinder

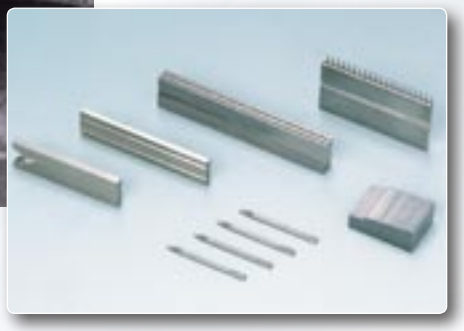


Press tool punch

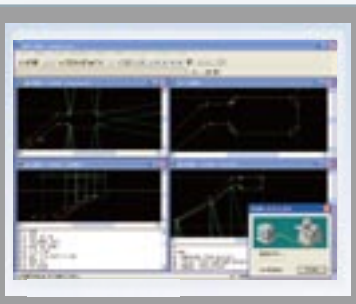
Special tool

Forming grinder





Mold tool parts

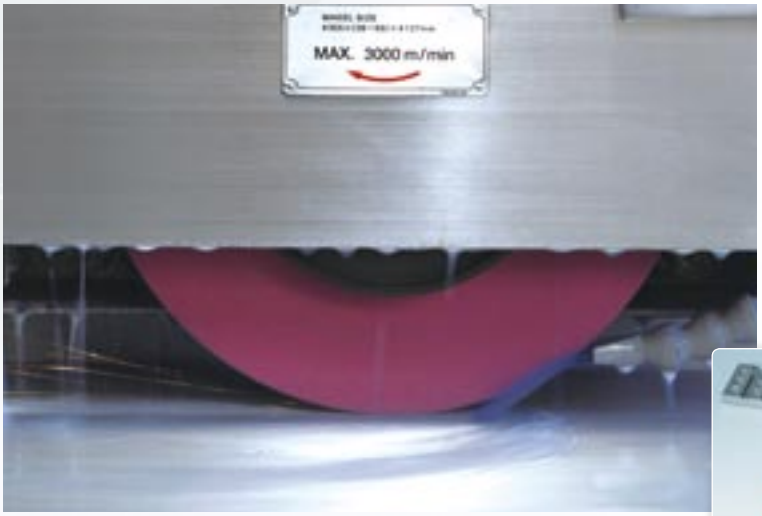


Start to finish are efficiently linked.

WAPS(Auto-Programming System).

It creates a program for each process from rough processing to finishing processing automatically.

Surface grinder



Press / mold tool parts

Rotary surface grinder

Round item-processing parts

Graphical profile grinder DV1

From “optical” to “graphical”
Evolution of the profile always starts from AMADA MACHINE TOOLS.
Compact, chartless and full-auto third-generation profile

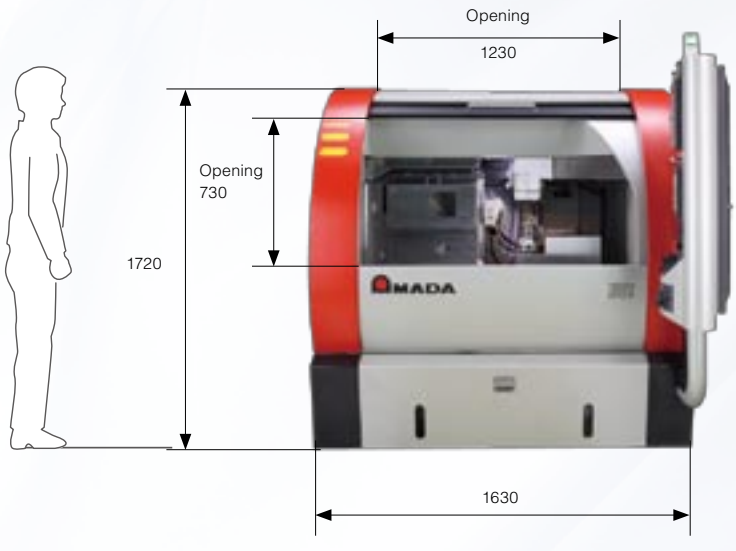
Sample work

Ultra-precise tool press punch die

Characteristic 1

Compact & Entirely-covered specification

A newly designed full-cover is adopted where space saving is balanced with operational functionality provided by wide access opening.
At the same time, the safety of operation and environmental performance are remarkably improved.



(mm)

● Options are included with the machine shown in this photo.

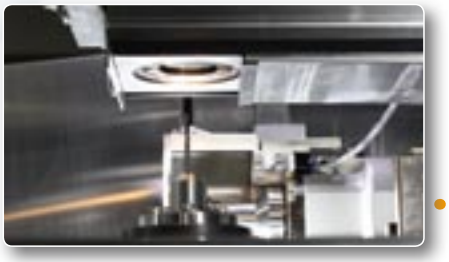
Characteristic 2

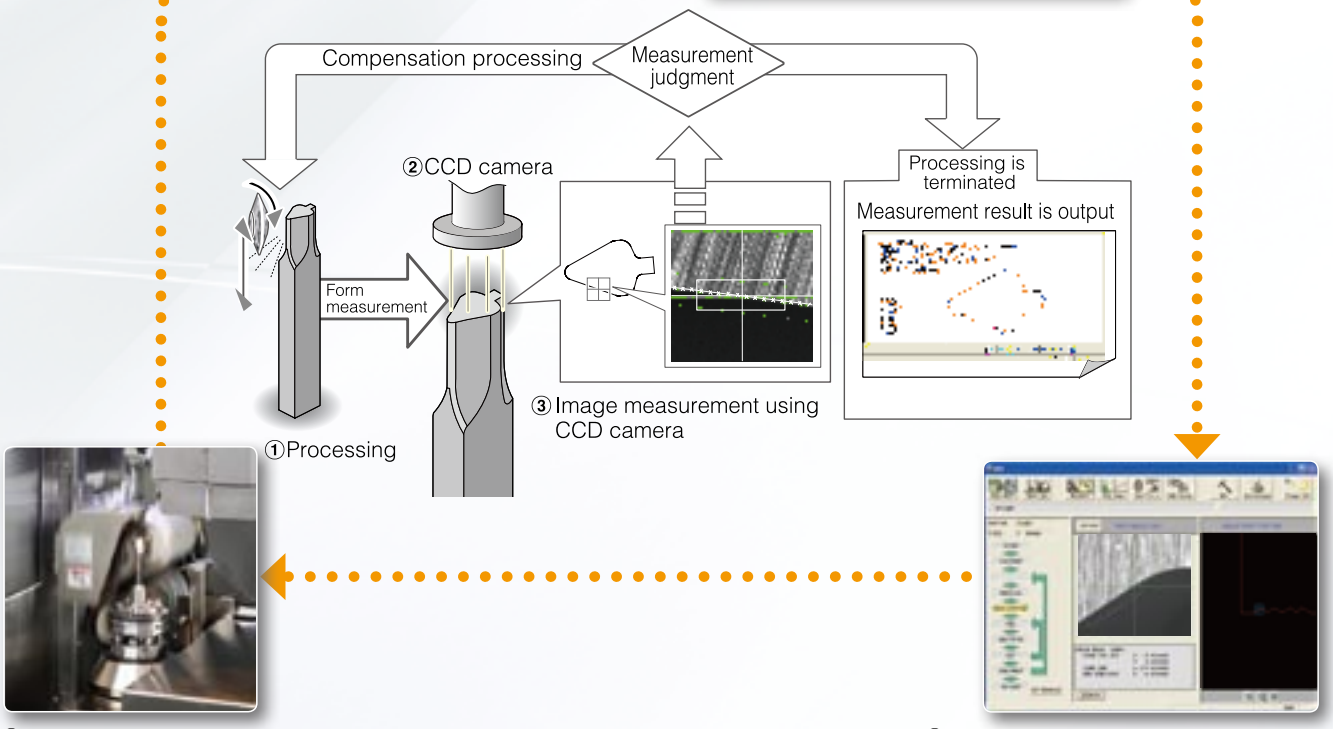
From auto measurement to auto compensation processing

High-quality work piece processing is fully automated by automatic image measurement using a CCD camera. Furthermore, the automation of compensation processing is also realized by a tolerance judgment function after the finishing processing.

DV-1 processing flow

② Automatic image measurement using a CCD camera.





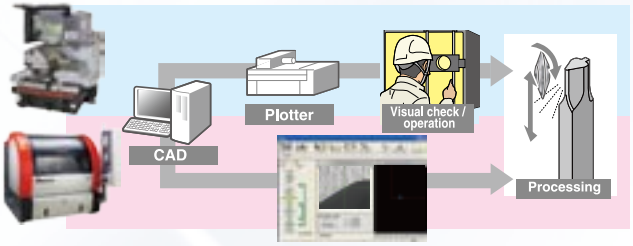
① Processing by processing program

③ Measurement result (compensation processing / termination of processing) is automatically determined

Characteristic 3

Stability of process quality by complete automation

Through completely unmanned chartless finish processing, the variation of processing standards is remarkably reduced.



Complete automation

Characteristic 4

Response to very small, fine shapes

The automatic inspection system can qualify very small shapes of 1 degree angle or less, which cannot be easily measured by projector.

Accuracy of CCD camera measurement

Horizontal edge direction (Y)
σ = 0.019 μm

Vertical edge direction (X)
σ = 0.013 μm

Repeated measurement accuracy

Magnification of monitor x 350

Profile grinder

This profile grinder is the accumulation of 70 years of expertise
We returned to the starting line and reviewed the basic configuration.
We now introduce the advanced profile that realizes "light" surface roughness.

Characteristic 1

High-accuracy / high-definition projector

The brightness is improved by approximately 15% compared to existing machines due to the newly designed lighting system. An oil-cooled inverter allowing ±0.1°C control is mounted as standard equipment.

Characteristic 2

High-reciprocating and high-accuracy wheel head slope way

Through high-accuracy and high-resolution optical scale are incorporated, ultraprecise feeding is realized. High rigidity provided by a three-dimensional design and a stable balanced structure deliver high reciprocation of 600 min^{-1}.
(Reciprocation stroke length 80 mm)

Characteristic 3

High-accuracy / high-speed spindle (TC-20)

The primary spindle has achieved high speed, high accuracy and low heat generation. A high-speed spindle that realizes enhanced light surface roughness is mounted. An oil-cooled inverter allowing ±0.1°C control is mounted as standard equipment.

GLS5P

Lineup of profile grinder accessories

GLS5T

It provides a reciprocation stroke length of 155 mm and high reciprocating-compliance of 400 min^{-1}. It performs various types of work easily. It also covers various molding grinding processing by combining with flowing attachments and large-capacity wet type specification.

High-accuracy / high-rigidity spindle (TS-6)
A low-speed / high-output spindle (6,000 min^{-1}) supporting a large-diameter grinding wheel is mounted. TC-20 (20,000 min^{-1}) can also be attached depending on the item to be processed.

● Options are included with the machine shown in this photo.

Characteristic 4

Gravity center design bed

With the newly developed bed, the allocation of jack bolt and ribbing are optimized.
It solves the flexure at the center and realizes high static accuracy.

Characteristic 5

Control device

A large 10.4-inch screen LCD panel is adopted and various types of software can be installed. It improves the operability and supports high-accuracy processing.

Characteristic 6

Shortening of setup time

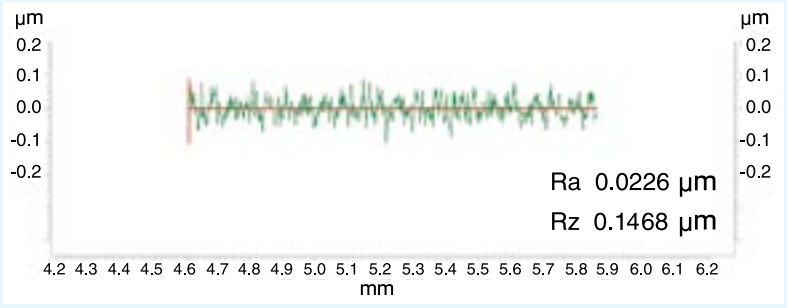
The positioning speed of each spindle axis is increased, such as fast-forward speed: 1,500 mm/min and table up-and-down speed: 300 mm/min, increasing the processing efficiency. Dedicated software also enables automatic work setup.

Characteristic 7

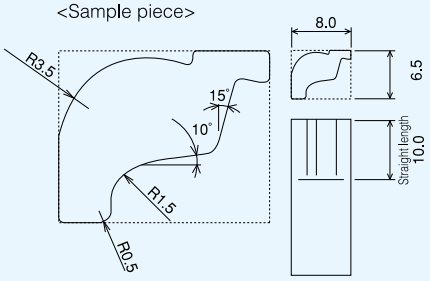
Space-saving design

The machine is approximately 25% smaller than the existing model thanks to optimum design based on structure analysis.

Chart of grinding surface roughness (GLS-5P)



<Sample piece>



<Processing condition>

- Material: G5 (ultra hard)
- Reciprocation stroke: 13 mm
- Wheel type: TWD700R2 (ø75)
  Tip R0.04
- Spindle RPM: 14,000 min^{-1}
- Speed of finishing feed: 1 mm/min

Options

On board R-form dresser
Used for reforming the radius of the profiling wheel. It is easily programmed by operator through canned cycle.

Circular grinding attachment
This is the attachment for the grinding cylinder part / tool etc. Swing: ø200, distance between centers: 200, dead center / live center common-use type.

Automatic work swivel unit (plated through hole ø32 specification)
It can be set to an indexable angle or continuous feed applications. One setting can provide complete periphery processing of the work.

Tool nose touch probe
3-axis teaching function for part qualification.

Forming grinder

“Forming” series for customer usability
The lineup of products is prepared according to the setting of the form grinding process.

Characteristic 1

Original trihedral independent column type

A T-type bed and long slide column base are adopted and high straightness accuracy and superior workability are realized.

Characteristic 2

Hybrid guide

A hybrid guide that balances submicron follow-up and oscillation dampening is adopted for the vertical axis and anterior-posterior axis. A resolution of 0.05 μm is provided as standard.

WS SP

Lineup of forming grinder

WINSTAR

- Control of simultaneous 2 axes + 1 axis on both sides
- Chuck size: 500 x 270 mm
- 3.7 kW spindle motor
- Right and left scales + servo valve control (with teaching function)

MS G3

- Control of simultaneous 2 axes + 1 axis on both sides
- Chuck size: 400 x 200 mm
- 2.2 kW spindle motor
- Right and left scales + servo valve control (with teaching function)

MS V3

- Control of simultaneous 2 axes + 1 axis on both sides
- Chuck size: 350 x 150 mm
- 2.2 kW spindle motor
- Right and left scales + servo valve control (with teaching function)

TF H1

- Chuck size: 350 x 150 mm
- 1.5 kW spindle motor
- Right and left hydrodynamic drive (servo valve control)
- Cut of upper and lower pulses (with up and down / front and back scale counter)

TF M1

- Chuck size: 350 x 150 mm
- 1.5 kW spindle motor
- Right and left manual feeding
- Cut of upper and lower pulses (with up and down scale counter)

● Options are included with the machine shown in this photo.

Characteristic 3

V-V sliding surface with no overhang

With right and left feeding, straight accuracy is maintained by a V-V sliding surface with no overhang. The high reciprocating by hydraulic servo pulse feedback control, the pulse handle for improving operability and the teaching function are mounted as standard equipment.

Characteristic 4

Ultra-low vibration oil-cooled spindle motor

For the grindstone spindle, an original ultra-low vibration oil-cooled primary spindle motor that realizes original ultra mirrored surface grinding is adopted. The oil bath cooling function is mounted as standard equipment to control the thermal displacement.

Characteristic 5

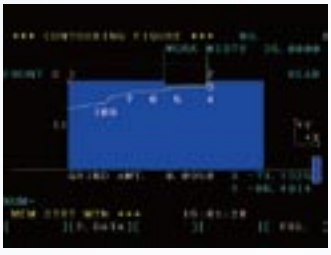
Newly designed full cover

The exterior meets strict environment and safety standards. The special coating and stainless parts improve the durability.

Original software

The software of MS G3/V3 and TS A3/D3 has a “fixed cycle” of Japanese dialogue input method. It enables proficient operation without knowledge of complex NC programming.

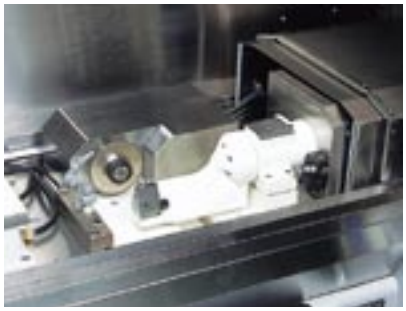
Pattern grinding
Complex shapes can be processed easily by combining 5 patterns. As the combination of plunge and traverse is available, appropriate processing can be selected.



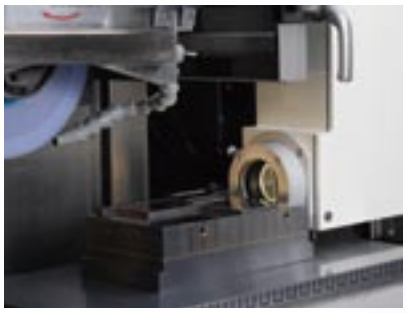
Contour grinding
Molding grinding can be implemented by inputting the graphic data of arbitrary shapes. Rough grinding by plunge grinding can be implemented. The created data can be saved in the NC program area.

Pattern dressing
The grindstones perform the molding using a simple profile dresser, NC profile dresser or high-speed wafer dresser just by inputting the dimensions required for the basic shape on the screen. The grindstones can perform the molding during processing and interrupt dressing.

Options



NC profile dresser
The grindstone performs the molding while spinning the dresser by servo motor. The grindstone dresser can perform the dressing for 3 axes while maintaining a constant angle (normal line control). As the molding is always performed at 1 point of dressing, a high-accuracy shape can be acquired.



CCD camera (shape measurement)
After the grindstone has performed the molding, the width, angle radius and shape of the grindstone can be measured without removing the chuck. Consequently, incorrect positioning of the grindstone and measurement error due to removal and attachment can be resolved. For measurement of processing after the shape has been processed, errors can be checked with the same processing program.

Automatic measurement equipment (touch probe type)
The measurement is implemented after the processing up to predefined dimension has been completed during automatic operation according to a fixed cycle. If additional grinding is necessary, automatic correction processing is continuously executed. The standard value for acceptance can be set arbitrarily. As the measurement is implemented using the vertical axis (Y-axis) of this machine, the measurement resolution is 0.05 µm.

Surface grinder

A high-rigidity low center of gravity bed and a table without an overhang can be applied to both heavy and high-accuracy grinding. Capable of processing a wide range parts sizes through our line up of 9 models. We can adapt to various applications.

Column type

TS SERIES 94/95/96/125/126

Long-awaited wide-type now available

Characteristic 1

Independent trihedral rigid C-column structure

T-shaped heavy rigid bed with integrated guide surface. Excellent operability while maintaining high linear accuracy allows for long-term stable operation.

Characteristic 2

No right or left overhang

Right and left feeding realizes a high 1.5μm linear accuracy with a no-overhang hybrid sliding face. The vertical axis utilizes a direct operated roller. Mirror finish is facilitated by sub-micron trackability.

Characteristic 3

Various table sizes

5 medium-sized models adapted to processing size. Selection of optimal table size from 900mm x 400mm - 1200mm x 600 mm.

Characteristic 4

A range of original software

Operability is improved by a redesigned original NC operation panel. Equipped with AMADA MACHINE TOOLS' well-established software improves processing efficiency.

Surface Grinder Lineup

Smallest floorspace in its class. A new level of operability is realized by integrating operation handles for accessability and adoption of a compact control panel. Our high processing efficiency is achieved through the utilization of AMADA MACHINE TOOLS' well-established software.

TSD3

- Simultaneous biaxial and right and left uniaxial control (non-hydraulic)
- Chuck size : 600 x 400 mm
- 3.7 kW spindle motor
- Front and rear reversal right and left position teaching function

TSD1

- Control of 1 vertical axis
- Chuck size: 600 x 400 mm
- 3.7 kW spindle motor
- Front and rear / right and left reversal position teaching function

● Options are included with the machine shown in this photo.

Saddle type

TSA3

- 2 axes independent control + 1 axis control table
- Chuck size: 500 x 200 mm
- 3.7 kW spindle motor
- Table stroke linear scale + high speed servo valve (with teach function)

TSA1

- 1 axis control, vertical
- Chuck size: 500 x 200 mm
- 3.7 kW spindle motor
- Front and rear reversal position teaching function

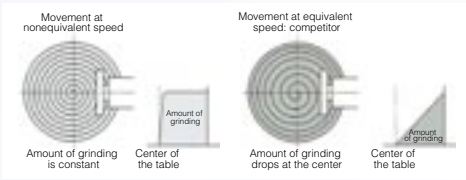
Rotary surface grinder

The well-established ram structure of this machine becomes more usable and high efficiency

Characteristic 1

Three-fold productivity rate of reciprocating type

SSR-5 has three-fold the productivity rate compared with a horizontal axis square table surface grinder with equivalent working area (grinding area) in the time of one cutting (grinding of entire working area is completed).



SSR5

- 3-axes control
- Chuck size: ø500 mm
- 7.5 kW spindle motor
- Ram reversal position teaching function

Characteristic 2

Low environmental load non-hydraulic pressure

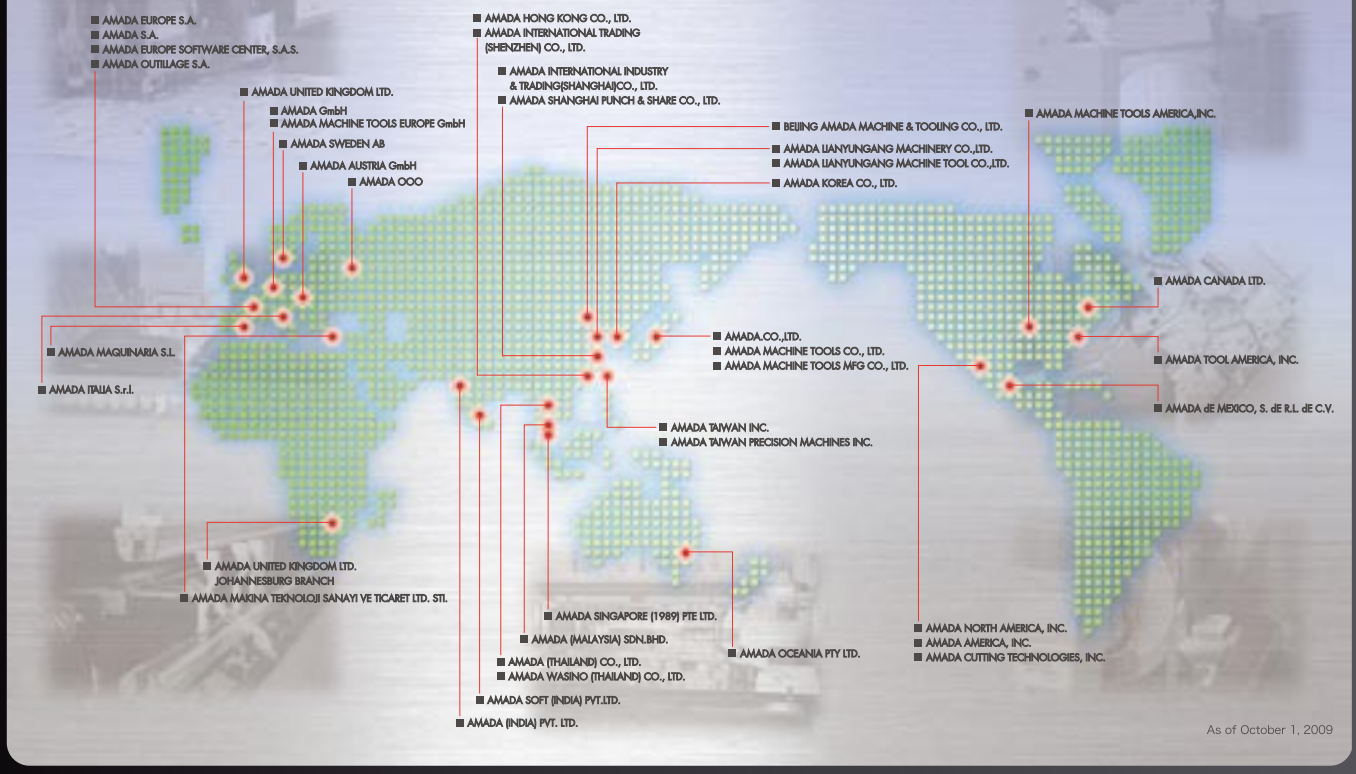
The existing hydraulic system has been eliminated. Thermal displacement is remarkably reduced by environment-responsive structure / non-hydraulic pressure NS specification and it also enables high accuracy.

Characteristic 3

Every spindle shifts to NC

Original rotary-dedicated software is installed. The automatic table dressing and automatic measurement function is enabled.

AMADA GROUP GLOBAL NETWORKS



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- The products in the catalog may be subject to the provisions of foreign exchange and the Foreign Trade Law. When exporting cargo subject to such controls, permission pursuant to regulation is required. Please contact our business representative in advance when exporting products overseas.
- When using our products, safety equipment is required depending on the operational task.
- For safe and correct operation, ensure thorough reference to the Instruction Manual prior to operation.
- The grinding performance data in this catalog for example is affected by temperature, the grinding materials, grinding stone and grinding conditions etc. Please note that such data are not guaranteed.

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