Okamoto

Precision Rotary Surface Grinding Machine
PRG Series

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JQA–QMA10960

CAUTION

*Prior to and while using our products you are requested to thoroughly go through the articles on danger, warning and attention for the sake of safety described in operation manual attached to the machine and also in the warning plates mounted on the machine.
*When the products fall under the export controlled goods stipulated in “Foreign Exchange and Foreign Trade Act”, it requires the license or approval of Government of Japan when exporting out of Japan.
*Specifications subject to change without notice.

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Ultra Precision

High Productivity

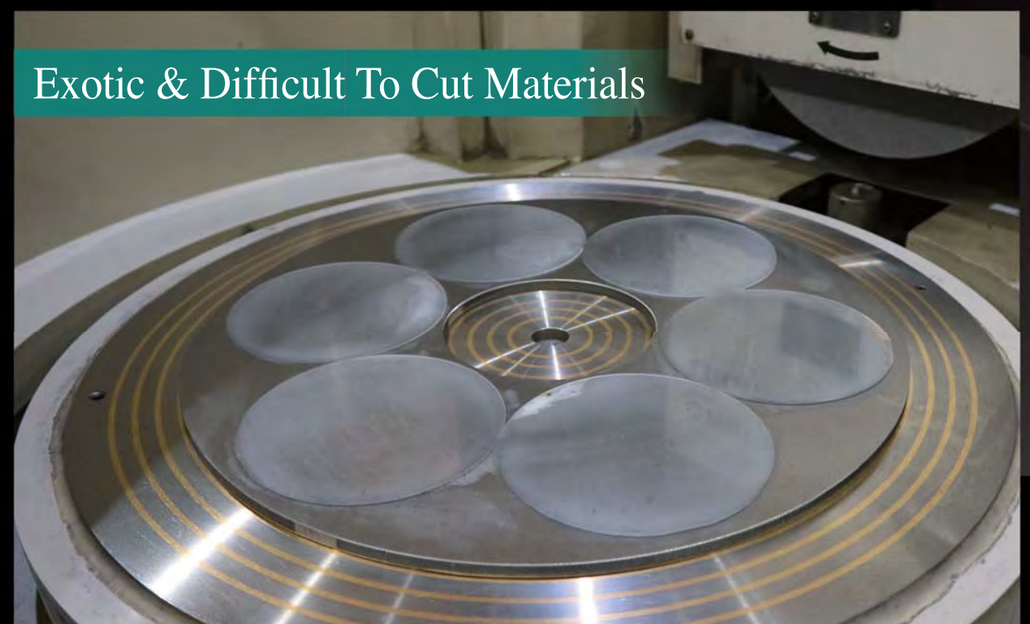
High Efficiency

Precision Rotary Surface Grinding Machine PRG Series

Rotary surface grinding machines have more than twice the productivity compared to reciprocating surface grinding machines. Achieving better stability & higher accuracy due to the highly rigid construction, we can control infeeds as low as 0.1um.

CONTENTS

Universal & Multi-Step



Exotic & Difficult To Cut Materials

Mass Production & Automation Capabilities

Precision Rotary Surface Grinding Machine Series

Since the chuck rotates in the rotary surface grinding machines, cycle time is reduced to half or less compared to the reciprocating surface grinding machines. With double-column structure, it endures heavy workpieces and guarantees high accuracy and longevity.

Conventional type — PRG-DX Series

ϕ 600mm
ϕ 800mm

- Equipped with automatic cycle function of "coarse grinding -> fine grinding -> spark-out -> stop at workpiece peripheral end".
- The stoke limits of the outer and inner peripheral ends of the workpiece is set by jog feed teaching positions.
- Minimum vertical feed setting increment is 0.1 μm.
- Double-column structure is used to maintains high rigidity and machine accuracy.

PRG6DX
Photo shown with optional accessories.

NC — PRG-DXNC Series

ϕ 600mm
ϕ 800mm

- Fully featured graphical interactive software supports automatic dressing during grinding cycle.
- Up to 4 steps can be ground using the graphic interactive software, between either traverse or plunge grinding cycles.
- Automation ready for high productivity in combination with measuring devices such as touch probe.
- Variable feed speed function controls the grinding amount, keeping it constant regardless of the position of the wheel over the rotary table.

PRG8DXNC
Hydrostatic spindle modell
Photo shown with optional accessories.

NC Large Capacity — PRG10/12DXNC Series

ϕ 1000mm
ϕ 1200mm

- Table can be tilted. Ideal for grinding tapered workpieces with angles and blade shaped workpieces.
- Chuck modification is available for grinding ceramics and difficult-to-cut materials.
- Standard wheel size is increased to ϕ510 × 50 × ϕ127 for high-efficiency grinding.

PRG12DXNC
Hydrostatic table guideway model
Photo shown with optional accessories.

Small type Ultra Precision — UPR3NC

ϕ 300mm

- Utilizing variable hydrostatics for the guideway of table and air bearings. The rotation table drive can meet the requirements for parallelism and flatness of 0.3 μm.
- Ultra-precision model with minimum infeed setting of 0.01 μm

UPR3NC
Photo shown with optional accessories.

Large type Ultra Precision — UPR180NC

ϕ 1800mm

- Years of experience in ultra-precision grinding technology of the double-column grinding machines and rotary grinding machines allow of high quality products.
- High rigidity variable hydrostatic slide is used for the crossrail.
- Table rotation spindle uses hydrostatic system to maintain high accuracy.

UPR180NC
Photo shown with optional accessories.

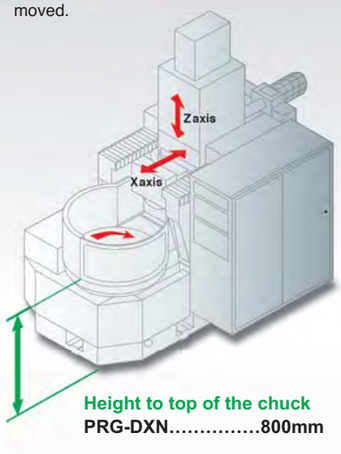
Construction and Features

Standard Original double-column structure that supports stable feed and high-precision grinding

Double-column structure is utilized for high rigidity during the wheel movement.
Unlike other rotary grinding machines, the table does not move up and down or back and forth, resulting in better operability and improved accuracy.

Since the table does not shift, the operator can work without changing their position. In addition, the height to the top of the chuck is low due to the structure, and the workpiece can easily be positioned or removed.

High rigidity double-column structure built for longevity



Standard Fixed dressing point

By fixing the dressing point, we can eliminate inconsistencies and misalignments caused by regular environmental changes, allowing us to achieve high-precision grinding.

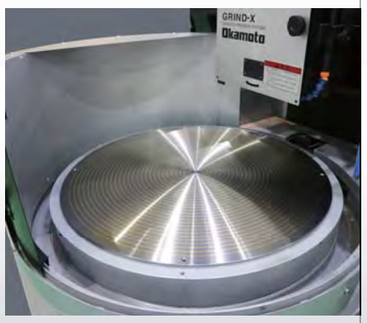
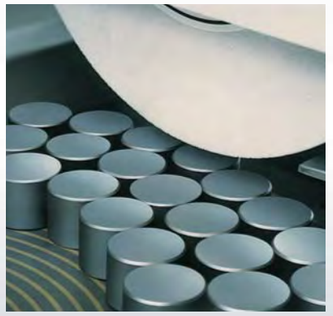


Table-mounted dresser

Standard Variable feed speed stabilizes the grinding conditions

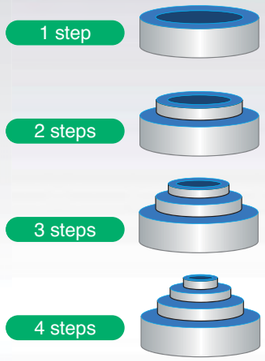
As the wheel strokes from the outer diameter to the center of the table, the table rotation speed increases, while the wheel feed speed also increases, and the grinding amount remains constant regardless of the position of the wheel over the rotary table.



Processing mass-volume workpieces with constant accuracy

DXNC Multi-step grinding up to 4 steps

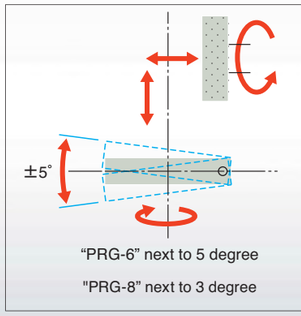
4 steps maximum can be ground using the graphic interactive software, interactive software, between either traverse or plunge grinding cycles.



Blue color shows areas ground

Standard Grinding with tilted table allows for a wide range of applications

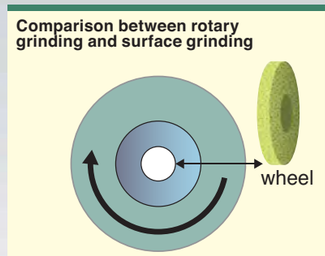
With a simple operation, the table can be tilted ± 5° maximum, making it ideal for grinding cylindrical taper shaped parts.



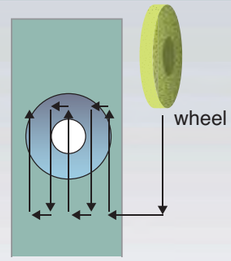
"PRG-6" next to 5 degree
"PRG-8" next to 3 degree

Feature Rotary grinding is ideal for mass production of flat surface grinding of round workpieces

Comparison between rotary grinding and surface grinding



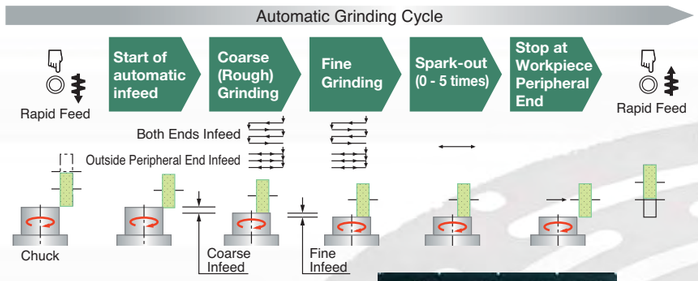
on Rotary Grinding Machine ϕ400mm (Bore 300 mm) grinding allowance: 0.5 mm		
Coarse	0.45mm	5 min
Fine & Spark Out Grinding	0.05mm	8 min
Total		13 min



on Reciprocating Grinding Machine ϕ400mm (Bore 300 mm) grinding allowance: 0.5 mm		
Coarse	0.45mm	30 min
Fine & Spark Out Grinding	0.05mm	33 min
Total		63 min

DX Increased productivity with automatic cycle Wheel spindle for vertical and cross feed

Equipped with automatic cycle function of "coarse grinding ->find grinding -> spark-out -> stop at workpiece peripheral end"
Possible to change the settings of downfeed by step infeed amount, table rotation speed, total remaining grinding allowance and variable speed even during automatic cycle.



DX Operation which uses manual input

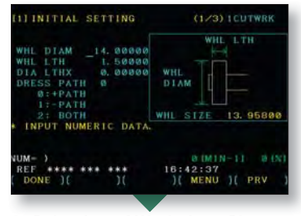
- Efficiency is established by the manual interruption function during the automatic cycle.
- Wheel spindle vertical and cross feed is controlled by our original LSI control system and AC servo motor. Minimum setting unit is 0.1 μm

DX series operation panel

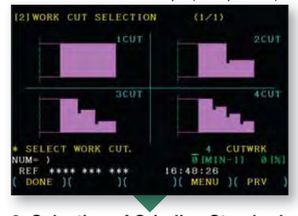
DXNC Fully featured graphic interactive software

Graphical display thoroughly supports your data input.

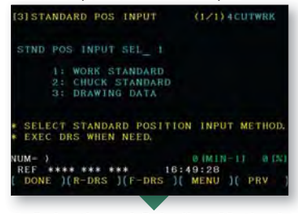
1. Initial Setting
Input wheel dimensions.



2. Selection of Workpiece Shape
Select the number of steps (4 steps max).



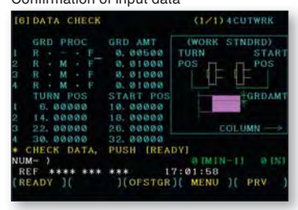
3. Selection of Grinding Standard
Select the workpiece datum or chuck datum as "0" point of dimension input.



4. Selection of Grinding Method
Select traverse or plunge cycle.

5. Input of Grinding Conditions
Interruptions from M.P.G. and dress interrupt during cycling is also available.

6. Setting Confirmation
Confirmation of input data



Specifications

Item			Unit	CNC Rotary Surface Grinding Machine				Rotary Surface Grinding Machine	
				PRG6DXNC	PRG8DXNC	PRG10DXNC	PRG12DXNC	PRG6DX	PRG8DX
Capacity	O.D. of Electromagnetic Chuck		mm	ϕ600	ϕ800	ϕ1000	ϕ1200	ϕ600	ϕ800
	Working Diameter of Electromagnetic Chuck		mm	ϕ552	ϕ752	ϕ930	ϕ1130	ϕ552	ϕ752
	Maximum Travel of Wheel		mm	ϕ750	ϕ950	ϕ1600		ϕ750	ϕ950
	Distance from Top of the Table to Bottom of the Wheel	Using ϕ355 mm Wheel (50Hz)	mm	−60～250		–		−60～250	
		Using ϕ305 mm Wheel (60Hz)	mm	−35～275		–		−35～275	
		Using ϕ510 mm Wheel	mm	–		500		–	
	Table Load Capacity (not including chuck)		kg	150	250	1200	1300	150	250
Table	Rotation Speed (constant speed control, CVT)		min^{-1}	20～150	15～130	8～65		20～150	20～130
	Tilting Angle		deg	±5	±3	±0.4		±5	±3
Wheel Head Cross Feed (X axis)	Driven By			AC Servo Motor					
	Cross Travel Distance		mm	450	550	860		450	550
	Feed Speed during Automatic Operation	Setting Range	mm/min	0～2000				(Volume) 200 - 2400	
		Override		Max 2000 (0 - 150%)				–	
		Rapid Feed		4000		5000		–	
	Manual Pulse Feed	Feed per Handwheel Revolution (x1/x10/x100)	mm	0.01/0.1/1.0 (x1/x10/x100)				0.1/1.0 (x1/x10)	
		Feed per Handwheel Graduation (x1/x10/x100)	mm	0.0001/0.001/0.01 (x1/x10/x100)				0.001/0.01 (x1/x10)	
		Jog Feed (16 steps)	mm/min	0～2000				200～2400	
		Rapid Feed		4000		5000		–	
Wheel Head Vertical Feed (Z axis)	Driven By			AC Servo Motor					
	Cross Travel Distance		mm	310		620		310	
	Feed Speed during Automatic Operation	Setting Range	mm/min	0～2000				–	
		Override		Max 2000 (0 - 150%)				–	
		Rapid Feed		4000		2000		–	
	Manual Pulse Feed	Feed per Handwheel Revolution (x1/x10/x100)	mm	0.01/0.1/1.0					
		Feed per Handwheel Graduation (x1/x10/x100)	mm	0.0001/0.001/0.01					
		Jog Feed (16 steps)	mm/min	0～2000				–	
		Rapid Feed		4000		2000		400/800	
Grinding Wheel	O.D. x W x B (50Hz/60Hz)		mm	ϕ355/ϕ305x38 (max50) xϕ127		ϕ510x50 (OP: max75)xϕ127		ϕ355/ϕ305x38 (max50) xϕ127	
	Rotation Speed (50Hz/60Hz)		min^{-1}	1500/1800		1000/1200		1500/1800	
Motor	For Wheel Spindle		kW	11		7.5		7.5	
	For Rotary Table Drive			2.2	3.7	7.5		2.2	3.7
	For Vertical Feed (AC Servo Motor)			3.0		1.8		0.75	
	For Cross Feed (AC Servo Motor)			1.6		1.8		0.75	
	Lubricant	For Slideway		0.1		2.2		0.1	
		For Collecting Table Lubricant		0.04		–		0.04	
Power Supply	Power Consumption		kVA	31	34	35		20	23
Distance from Floor to Top of the Chuck			mm	800		1260		800	
Floor Space	Width x Depth x Height (including coolant system)		mm	1665x3250 x2576	1810x3450 x2616	5135x4300x3581		1665x3025 x2576	1810x3450 x2616
Weight	Net Weight		kg	4000	5000	12800	13000	4000	5000

*Power consumption and floor space etc. may vary depending on the specifications & options.

Item	Unit	CNC Ultra Precision Rotary Surface Grinding Machine	
		UPR3NC	UPR180NC
Chuck O.D.	mm	ϕ300	ϕ1800
Maximum Travel of Wheel	mm	ϕ400	ϕ2000
Distance from Floor to Top of the Chuck	mm	205	600
Table Load Capacity	kg	180	1000
Table Rotation Speed	min^{-1}	10～300	5～50
Tilting Angle	deg	±0.3	±0.15
Net Weight	kg	2500	45000

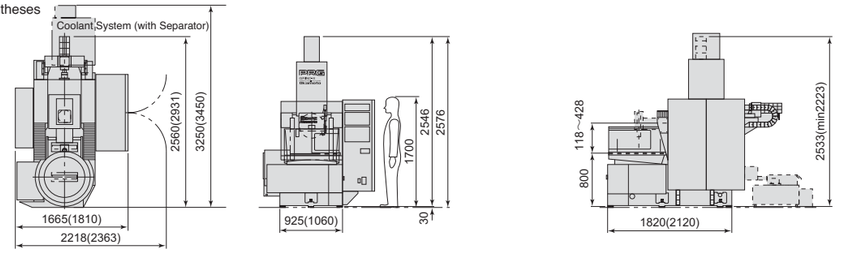
Standard Accessories

Item	CNC Rotary Surface Grinding Machine			Rotary Surface Grinding Machine	
	PRG6DXNC	PRG8DXNC	PRG10DXNC PRG12DXNC	PRG6DX	PRG8DX
GRIND-X Wheel	●	●	●	●	●
Grinding Wheel Adaptor	●	●	●	●	●
Electromagnetic Chuck	●	●	●	●	●
Chuck Interlock	●	●	●	●	●
Automatic Demagnetizing Controller, Adjustable Chuck Power	●	●	●	●	●
Short Circuit Breaker	●	●	●	–	–
Color LED 8.4"	●	●	●	–	–
Splash Cover, Semi-Closed Style	●	●	●	●	●
Table Mounted Dresser, Fixed Type	●	●	●	●	●
Necessary Tools	●	●	●	●	●
Anchor Bolt	–	–	●	–	–
Leveling Bolts and Plates	●	●	●	●	●
Program Memory Capacity 512KB	●	●	●	–	–
Display of Operation Time and Workpiece Qty (to be input in present location of LCD display)	●	●	●	–	–
Spindle invertor	●	●	–	●	●
Fanuc Color LED Display - 8.4	●	●	●	–	–

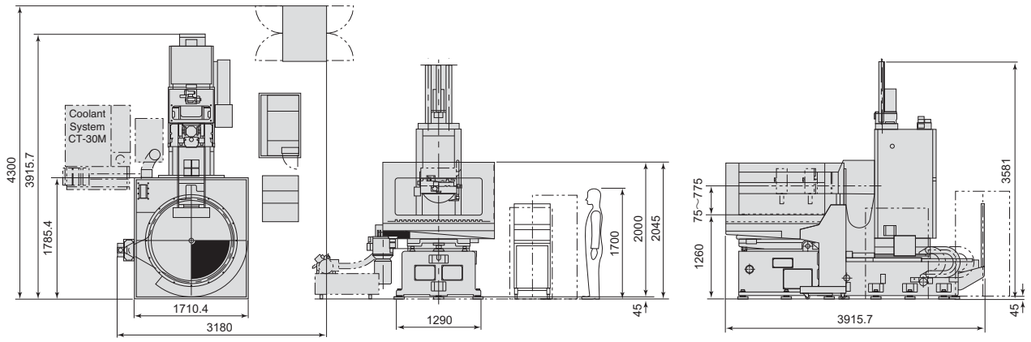
External View

PRG6DXNC/8DXNC

Dimensions in parentheses are of PRG8DXNC.

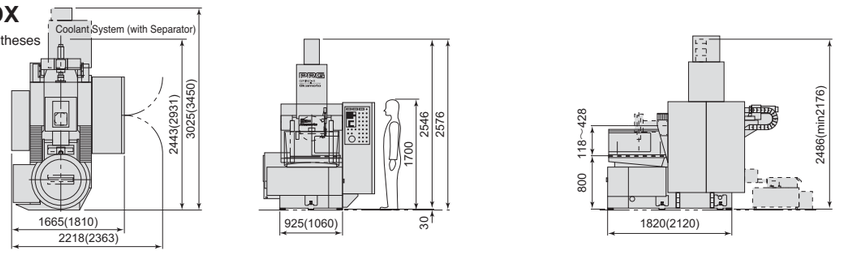


PRG10DXNC/12DXNC



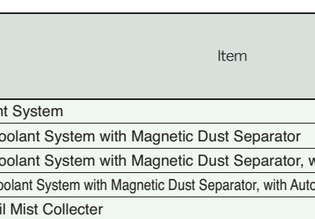
PRG6DX/8DX

Dimensions in parentheses are of PRG8DX.

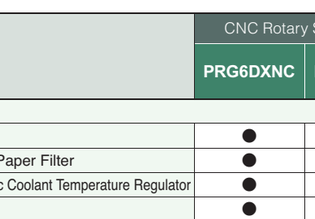


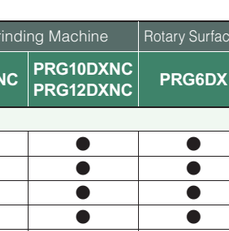
Optional Accessories

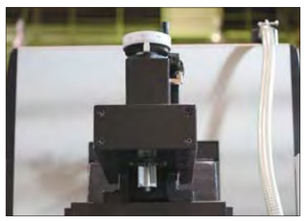
Item	CNC Rotary Surface Grinding Machine			Rotary Surface Grinding Machine	
	PRG6DXNC	PRG8DXNC	PRG10DXNC PRG12DXNC	PRG6DX	PRG8DX
1. Coolant System					
1) Coolant System with Magnetic Dust Separator	●	●	●	●	●
2) Coolant System with Magnetic Dust Separator, with Paper Filter	●	●	●	●	●
3) Coolant System with Magnetic Dust Separator, with Automatic Coolant Temperature Regulator	●	●	●	●	●
4) Oil Mist Collecter	●	●	●	●	●
5) Dust Collection Hood for Oil Mist Collecter	●	●	●	●	●
2. Wheel Balancer					
1) BW-360 with Balance Arbor	●	●	–	●	●
2) BW-500 with Balance Arbor	–	–	●	–	–
3. Micro-Balancer	●	●	●	●	●
4. Spare Grinding Wheel Adaptor	●	●	●	●	●
5. Spare Grinding Wheel Adaptor for Micro-Balancer	●	●	●	●	●
6. Crane for Wheel Adaptor	–	–	●	–	–
7. Overhead Dresser, Hydraulic	–	–	–	●	●
8. 2-direction Dresser (for OD, side-front dressing)	●	●	●	–	–
9. Power Up of Wheel Spindle, 11 kW	●	●	●	●	●
10. Spindle invertor for 11 kW					
Wheel Spindle Motor 11 kW, 2-Speed Setting 1000～2500min^{-1}	●	●	●	●	●
11. Wheel Spindle Meter Relay (emergency stop by spindle overload)	●	●	●	●	●
12. Table Rotation Speed Meter	●	●	●	●	●
13. Automatic Oil Temperature Regulator	●	●	●	●	●
14. Constant Coolant Supply for Table Drain Gutter	●	●	●	●	●
15. Manual Interruption (M.P.G. Interruption)	●	●	●	–	–
16. Timer of Accumulated Time					
1) Display of Accumulated Time of Hydraulic "ON"	●	●	●	–	–
2) Display of Accumulated Time of Wheel Spindle "ON"	●	●	●	–	–
17. Auto Shut Down Function	●	●	●	–	–
18. Signal Tower 3 Colors (on/off type, flashing type)	●	●	●	–	–
19. Calendar Timer (weekly timer, hydraulic "ON")	●	●	●	–	–
20. Work Light	●	●	●	●	●
21. GRIND-X Hydraulic Oil (to be used as lubricant)	●	●	●	●	●



GRIND-BIX Model


Raised Table Cover 300 mm


CE Mark Complied

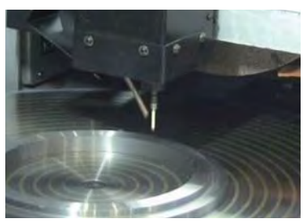

Overhead Dresser

Dust Collection Hood & Hose

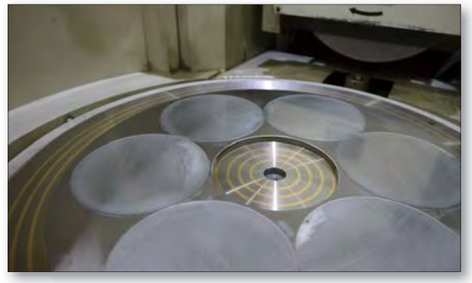

Oil Mist Collecter


Work Light


Wheel Balancer


Touch Probe

Example of Workpieces

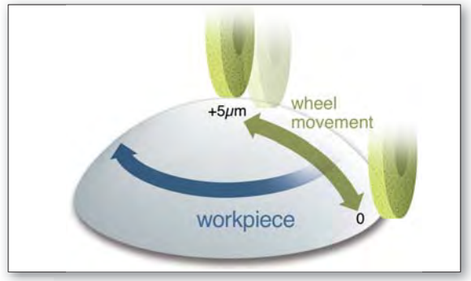


Wafer
We have experiences in grinding silicon, SiC, glass and quartz.

Thin Workpieces & Blades
Difficult thin workpieces can be ground without warping.

Gear & Multiple Diameter Workpieces
Suitable for mass production equipment and can grind multiple workpieces in one cycle.

Ceramics
Ideal for grinding brittle materials due to its rigid double column construction



Complex Workpiece
Workpiece that has corrugated shape in the center can be easily ground by CNC model.

Ultra Precision Spacer (UPR3NC)
Small workpieces that require ultra-precision flatness, such as bearing spacers for high-speed spindles can be ground.

Steps
Workpiece with multiple steps can be easily ground using the interactive software.

Bearings
Ideal for mass production of various bearing parts.