DISCO

Kiru·Kezuru·Migaku Technologies

Fully Automatic Grinder/Polisher DGP8761

Higher throughput grinder polisher for 300 mm wafers

Realizes an improvement in process stability and higher throughput

The DGP8761 is the successor to the DGP8760, a machine used by premier manufacturers worldwide. It integrates backside grinding and stress relief processing, and performs stable thin grinding to a thickness less than 25 µm. The DGP8761 is equipped with a newly developed spindle to support high-speed grinding. This contributes to a shorter thin wafer processing time (compared to DGP8760). In addition, an optimized handling layout shortens the cycle time (excluding processing time).

Various Z3 spindle applications

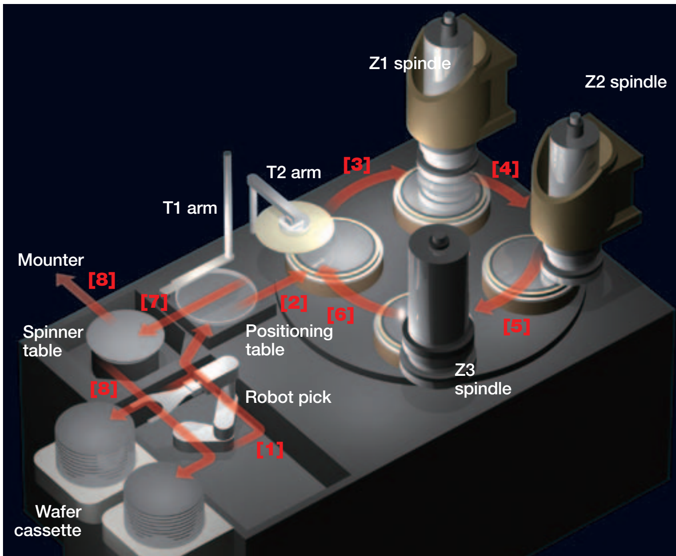
The following Z3 spindle applications for thin wafer processing can be selected.

Stress relief

- Dry polishing - an environmentally friendly process without chemicals or water
- CMP (optional)
- Slurry free polishing "E Pad" (optional)

Super fine grinding (optional)

- Poligrind
- UltraPoligrind



Fully Automatic Grinder/Polisher

DGP8761

DGP8761 Operation flow

[1] The robot pick removes the wafer from the cassette and places on the positioning table, where centering takes place.
[2] The T1 arm places the wafer on the chuck table.
[3] The wafer proceeds to Z1 for rough grinding.
[4] The wafer proceeds to Z2 for fine grinding.
[5] The wafer proceeds to Z3 for dry polishing (or ultra-high-mesh wheel grinding).
[6][7] The T2 arm removes the wafer from the chuck table and places it on the spinner table, where washing and drying take place.
[8] To the mounter (DFM2700, DFM2800). Or the robot pick returns the workpiece to the cassette.

Realizing applications that provide a gettering effect on the Z3-axis

Gettering DP

This is the solution that realizes high die strength and maintains the gettering effect by using DISCO's unique dry polishing.

*Gettering: a mechanism that forms a minute destructive layer (gettering sites) inside the silicon wafer and then the impurities, such as heavy metals, are captured at these gettering sites.

Grinding wheel "UltraPoligrind"

The newly developed UltraPoligrind wheel, which uses minute abrasives, can process thin wafers without chemicals. It can achieve high wafer strength that could not be obtained with a traditional grinding wheel, while maintaining the grinding gettering effect (Extrinsic Gettering).

System expandability

By integrating the DGP8761 with a multi-wafer mounter, such as the DFM2700/ DFM2800, it is possible to support the attachment of DAF (Die Attach Film) for thin wafers. It can also be configured in-line with DISCO's DBG (Dicing Before Grinding) system.

DISCO 8000 Series compatibility

DGP8761's grinding wheels, polishing wheels, dresser boards and spindles are all compatible with DISCO 8000 Series machines. In addition, operation method and GUI (Graphical User Interface) are based on proven 8000 Series technology.

DGP8761 Specification (Z3 spindle dry polish specification)

			Unit	
Wafer diameter			mm	Max. ø300 (ø8" - ø12")
Grinding method	Z1and Z2 axis		-	In-feed grinding with wafer rotation
	Z3 axis		-	Anomalous in-feed polishing with wafer rotation
Spindle	Type		-	Air bearing with high frequency motor
	Number of axes		-	3
	Output	Z1 and Z2 axes	kW	6.3
		Z3 axis	kW	6.3
	Revolution speed	Z1 and Z2 axes	min^{-1}	1,000 - 4,000
		Z3 axis	min^{-1}	1,000 - 4,000
	Z-axis vertical stroke	Z1 and Z2 axes	mm	120 (with zero point)
		Z3 axis	mm	65
	Z-axis vertical grinding feed speed		mm/s	0.0001 - 0.08
	Z-axis vertical fast feed speed		mm/s	50
	Min. Z-axis vertical movement		µm	0.1
	Min. Z-axis vertical movement resolution		µm	0.1
Wafer chuck table	Chuck table type		-	Porous chuck table
	Holding method		-	Vacuum
	Number of revolutions		min^{-1}	0 - 500
	Number of chuck tables		-	4
	Chuck table cleaning		-	Backflushing of water and compressed air is combined with a leveling stone and the atomizing nozzle
	Wafer cleaning		-	Water washing by atomizing nozzle
	Spark out (chuck table revolutions setting)		-	0 - 999
Grinding wheels	Diamond wheel	Z1 and Z2 axes	mm	ø300
	Dry polishing wheel	Z3 axis	mm	ø450
Wafer handling section/Wafer cleaning section				
	Cassette storage quantity		-	2
	Cassette flow		-	Same flow and open flow
	Spinner unit		-	Water washing by atomizing nozzle and drying
Vacuum	Discharge speed			20/28 m^3/h, 50/60 Hz (at -90 kPa)
	Achievable pressure		kPa	-90 (at water supply temperature 15 °C and flow rate 1 L/min)
	Electric motor		kW	1.5
	Water flow rate		L/min	2.0 (when water supply temperature is less than 30 °C) 1.5 (when water supply temperature is less than 25 °C) 1.0 (when water supply temperature is less than 20 °C)
Grinding accuracy (When using the dedicated chuck tables (when processing ø300 mm wafers))				
	Thickness variation within one wafer		µm	less than 2.5 (less than 2.5 when using only Z1 and Z2)
	Thickness variation between wafers		µm	±2.5 (±2.5 when using only Z1 and Z2)
	Finish surface roughness		µm	Ra less than 0.005 [when using only Z1 and Z2 Ry approx 0.13 (#2000 fine grinding)]
Utilities	Power supply		V	200 V AC±10 %, 3-phase (50/60 Hz) For other than the above voltages, a transformer is necessary
	Power comsuption	During processing	kW	12 (for reference)
		During warm-up	kW	6 (for reference)
	Max. power		kVA	31
	Air pressure	Main body	MPa	0.6 - 0.8
		Polishing residue collector	MPa	0.3 - 0.5
	Air flow rate	Main body	L/min (ANR)	During max. flow: 1,400 or less Average during processing: 700 or less During warming up: 300 or less
		Polishing residue collector	L/min (ANR)	50
	Water pressure	Grinding and cleaning	MPa	0.3 - 0.4
		Cooling water and vaccum pump	MPa	0.2 - 0.3
		Vacuum pump	MPa	0.05 - 0.45
		Polishing residue collector	MPa	0.2 - 0.3
	Water flow	Grinding and cleaning	L/min	25
		Cooling water	L/min	14 or higher
		Vacuum pump	L/min	2.0 (when water supply temperature is less than 30 °C) 1.5 (when water supply temperature is less than 25 °C) 1.0 (when water supply temperature is less than 20 °C)
		Polishing residue collector	L/min	4
	Exhaust duct capacity		m^3/min	4 x 2
	Machine dimensions (W x D x H)		mm	1,690 x 3,315 x 1,800
	Machine weight		kg	6,300

A vacuum unit and polishing residue collector are installed as standard.

Environmental conditions

- Use clean, oil-free air at a dew point of -15 °C or less.
  (Use a residual oil: 0.1 ppm. Filtration rating: 0.01 µm/99.5 % or more).
- Keep room temperature fluctuations within ±1 °C of the set value. (Set value should be between 20 - 25 °C).
- Use grinding water and cleaning water at room temperature +2°C (fluctuation range: within 1°C in one hour).
  For cooling water, use water controlled at 1°C in relation to the grinding water.
- The machines should be used in an environment, free from external vibration. Do not install machine near a ventilation opening, heat generation equipment or oil mist generating parts.
- This machine uses water.
  In case of water leakage, please install the machine on the floor with sufficient waterproofing and drainage treatments.

* All pressures specified above are gauge pressures.
* As the above specification may change due to technical modifications. Please confirm when placing your order.
* For further information, please contact your local sales representative.

DISCO

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