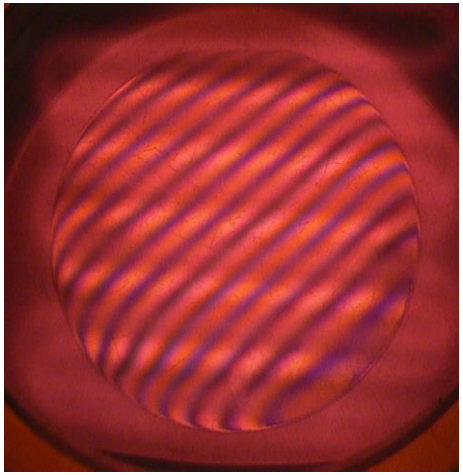
Company Profile

Zhejiang Optoelectronic Equipment Co., Ltd. was established in 2011. The company is committed to the research and application of high-precision flattening grinding and polishing technology, producing and manufacturing a series of high-quality precision grinding and polishing machinery; products are widely used in silicon carbide, sapphire, piezoelectric crystals, piezoelectric ceramics, molybdenum sheets, gallium arsenide, lanthanum glass, silicon wafers, optical optoelectronics, liquid crystal displays, LED, mobile phone accessories (metal, glass), memory hard disks, metalworking and other hard and brittle materials grinding and polishing.



Φ100×70μm (crystals)
9.6B polishing



4″(sapphire)piece



76×76×0.21㎜(Blue glass)
9B polishing

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Company Profile



Up to now, our company has obtained a total of 32 patents, of which 2 invention patents;

Main single-sided/double-sided grinding and polishing equipmen













Single-side 36B /50B	Sapphire、Silicon wafer、GaAs
22B-5	Silicon wafer、Sapphire 、Glass
18B/20B/21B	Silicon wafer、sapphire、Glass
16B-5	Silicon wafer、sapphire 、GaAs
14B	sapphire 、Blue glass
13B	Ceramic、Blue glass 、Glass
13.9B-9/12B-8	Ceramic、Blue glass 、Glass
9B9.6B	Piezoelectric crystals 、Blue glass 、 GaAs
5B 6B	Piezoelectric crystals

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5B/6B/6.4B double-sided grinding and polishing equipmen



- Dimensions: L1158× W908× H2151.5mm，
- Weight：1025kg
- Features: 3 motor drive, upper and lower plates, ring gear, center gear independent drive;
- Programmable controller PLC + touch screen;
- 20 different processing processes can be stored;
- The positive rotation of the fixture and the reversal of the fixture are used interactively to realize the automatic correction of the disk surface in the work.
- The CPU itself allocates the speed of the upper and lower plates, the center gear, and the ring gear, and can also manually set the appropriate speed, which can facilitate the operator to better design the rotation and rotation trajectory of the workpiece, set any rotation and rotation ratio, and achieve the best processing conditions and the best processing results.
- Precision load cell to achieve controllable pressure on the plate to ensure the safety of the workpiece when the plate is dropped. The whole pressure closed-loop feedback compensates the pressure value in real time to ensure the accuracy of the pressure;
- 3 motor drive, to the greatest extent to eliminate the impact of excess load, significantly extend the life of the fixture, ring of gear, center gear;
- The transmission adopts imported synchronous belt, which effectively eliminates the vibration generated by the transmission gear and is conducive to the processing of thinner size workpieces;

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5B/6B/6.4B parameter

Model		5B-8L/P	6B-5L/P	6.4B-6L/P
Upper and lower plate sizes	Grind（mm）	Φ380×Φ220×t25	Φ378×Φ148×t25	Φ398×Φ238×t25
	Polished（mm）	Φ388×Φ210×t25	Φ388×Φ135×t25	Φ398×Φ238×t25
Fixture parameters	Modulus	DP12	DP12	M2
	Number of teeth（Z）	Z50	Z66	Z50
	Pitch Circle（mm）	100.15mm	139.7mm	100
Drive mode	2motor	×	×	×
	3motor	●	●	●
	4motor	×	×	×
Number of fixtures		5	5	9
Maximum machining diameter（mm）		87	105	80
Maximum processing thickness（mm）		46	46	46
Thinnest processing thickness（mm）		0.02	0.02	0.02

Our products are different from other products on the market



Our 6B



Other 6B

The difference between our products and other products on the market

NO.	Morinaga 6B	Other 6B	Our advantages
1	3-MOTOR drive	1-MOTOR drive 2-MOTOR drive	Reduced vibration, improved stability, improved adaptability of fixtures, not easy to crack, so that thinner workpieces can be produced;
2	Adaptive pressure feedback system	Mechanical counterweight system	The pressure of falling and starting plate can be adjusted to eliminate excess impact to the greatest extent and improve the yield rate;
3	The rotation ratio of the swimming fixture is adjustable	The rotation ratio of the fixture is fixed	Diversification of process parameters can be achieved without changing the mechanical transmission ratio;
4	7 inch Mitsubishi touch screen	There is no touch screen	The picture is clearer, easy to operate, and has a long service life
5	Timing belt drive	Gear drive	Effectively eliminate the vibration generated by the motor, reducer, gear transmission, and is particularly helpful for processing extremely thin workpieces
6	Mitsubishi series inverters		Fast response, long service life, easy to install and maintain
7	CC-LINK communication	RS485	The motor reaction speed is more sensitive, the torque output is more gentle, and the workpiece crushing rate is low. The motor output speed is adjusted in real time to ensure an accurate rotation/rotation ratio
8	NSK bearings, SMC\CKD pneumatic elements	Generic brand elements	High precision and long life

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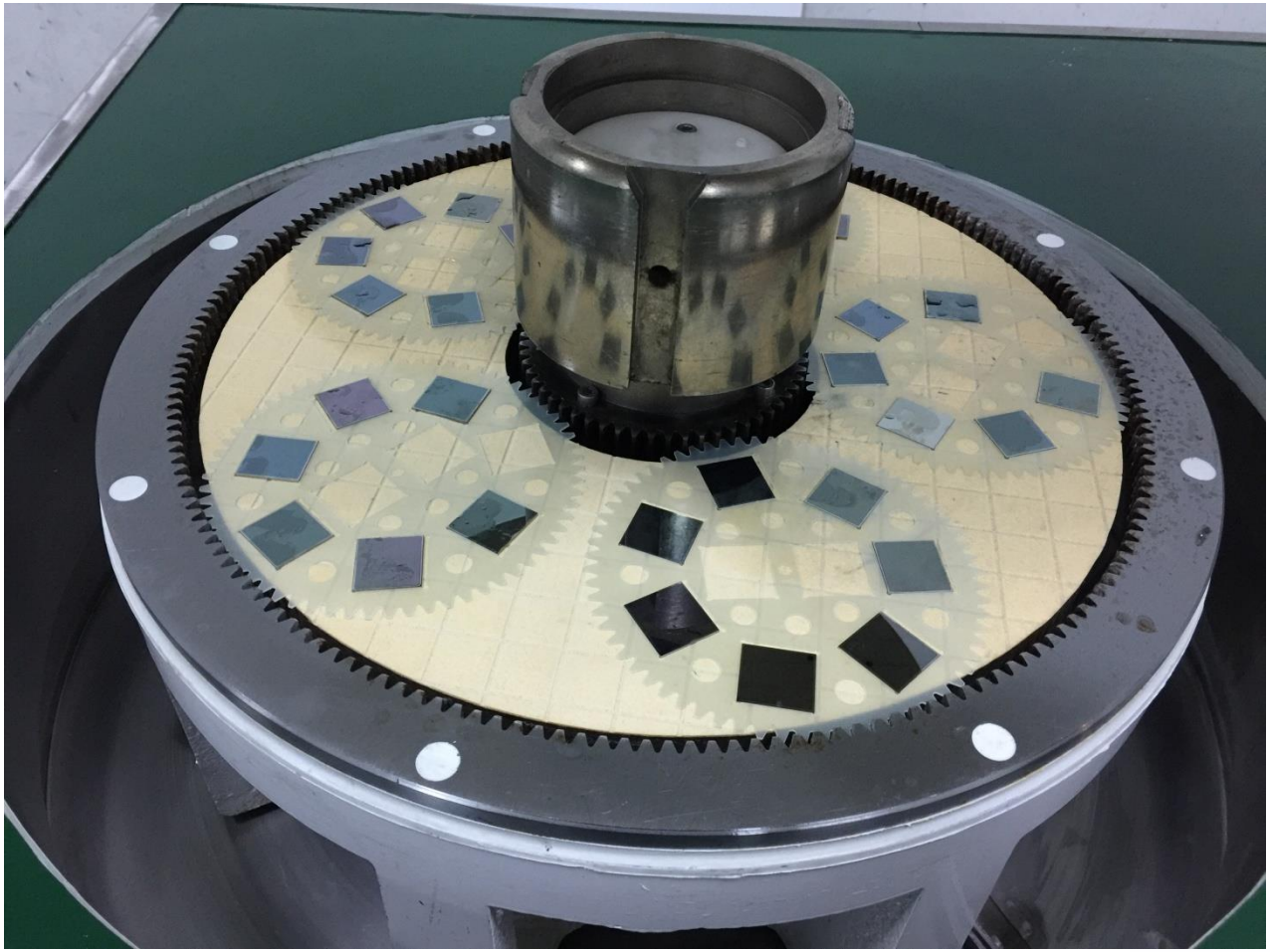
5B/6B/6.4B Major component brands

- **bearing**：Japan NSK
-
- **Pneumatic components :** CKD SMC
- Main cylinder：Japan CKD special injection low friction cylinder
- ITV, precision pressure regulator, speed control valve： Japan
- Solenoid valves, pressure reducing valves: Japan

- Electrical system:
- Mitsubishi Series PLC 三菱电机 MITSUBISHI ELECTRIC
- Mitsubishi series frequency converters
- Mitsubishi human-machine interface

- dynamical system：
- Taiwan TECO Electric TECO
- Self-made high-precision reducer

Machining examples



Zinc sulfide polishing

Troysupply.com

Machining examples



6.4B machine， 0.028mm crystal piece polishing

9B/9.6B Double-sided grinder/polisher



- Dimensions: L1450× W1045× H2430mm
- Weight：1650kg
- Features: 3 motor drive, upper and lower plates, ring gear, center gear independent drive; It can also be configured with a four-motor drive.
- Programmable controller PLC + touch screen;
- 20 different processing processes can be stored;
- The positive rotation of the fixture and the reversal of the fixture are used interactively to realize the automatic correction of the disk surface in the work.
- The CPU itself allocates the speed of the upper and lower plates, the center gear, and the ring gear, and can also manually set the appropriate speed, which can facilitate the operator to better design the rotation and rotation trajectory of the workpiece, set any rotation and rotation ratio, and achieve the best processing conditions and the best processing results.
- Precision load cell to achieve controllable pressure on the plate to ensure the safety of the workpiece when the plate is dropped. The whole pressure closed-loop feedback compensates the pressure value in real time to ensure the accuracy of the pressure;
- 3 motor drive, to the greatest extent to eliminate the impact of excess load, significantly extend the life of the fixture, ring of gear, center gear;

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9B/9.6B parameter

Model		9B-5L/P	9.6B-10L/P
Upper and lower plate sizes	Grind（mm）	Φ638×Φ234×t30	Φ615.5×Φ383.5×t35
	Polished（mm）	Φ640×Φ232×t30	Φ621.5×Φ379.5×t35
Fixture parameters	Modulus	DP12/M2	DP12
	Number of teeth（Z）	Z108/Z114	Z66
	Pitch Circle（mm）	228.6/228	139.7
Drive mode	2motor	×	×
	3motor	●	●
	4motor	●	●
Number of fixtures		5	10
Maximum machining diameter（mm）		150	90
Maximum processing thickness（mm）		66	66
Thinnest processing thickness（mm）		0.07	0.07

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Our products are different from other products on the market



Our 9B



Other 9B

The difference between our products and other products on the market

NO.	Morinaga 9B	Other 9B	Our advantages
1	3-MOTOR drive 4-MOTOR drive	1-MOTOR drive 2-MOTOR drive	Reduced vibration, improved stability, improved adaptability of fixtures, not easy to crack, so that thinner workpieces can be produced;
2	Adaptive pressure feedback system	Mechanical counterweight system	The pressure of falling and starting plate can be adjusted to eliminate excess impact to the greatest extent and improve the yield rate;
3	The rotation ratio of the swimming fixture is adjustable	The rotation ratio of the fixture is fixed	Diversification of process parameters can be achieved without changing the mechanical transmission ratio;
4	10 inch Mitsubishi touch screen	There is no touch screen	The picture is clearer, easy to operate, and has a long service life
5	The inner and outer ring gears are raised and lowered electrically at the same time	The inner and outer ring gears cannot be lifted or lowered individually	Extend the service life of the outer ring gear and the sun teeth, and improve the success rate of extremely thin workpieces;
6	Mitsubishi series inverters	Generic brand elements	Fast response, long service life, easy to install and maintain
7	CC-LINK communication	RS485	The motor reaction speed is more sensitive, the torque output is more gentle, and the workpiece crushing rate is low. The motor output speed is adjusted in real time to ensure an accurate rotation/rotation ratio
8	NSK bearings	Generic brand elements	High precision and long life
9	SMC specially injects low-friction self-locking cylinders CKD anti-interference solenoid valve CKD precision electronically controlled proportional valve	Generic brand elements	Fast air pressure response, strong safety and reliability

Troysupply.com

9B/9.6B Major component brands

- **bearing**： Japan NSK
-
- **Pneumatic components :** CKD SMC
- Main cylinder ： Japan CKD special injection low friction cylinder
- ITV, precision pressure regulator, speed control valve： Japan
- Solenoid valves, pressure reducing valves: Japan

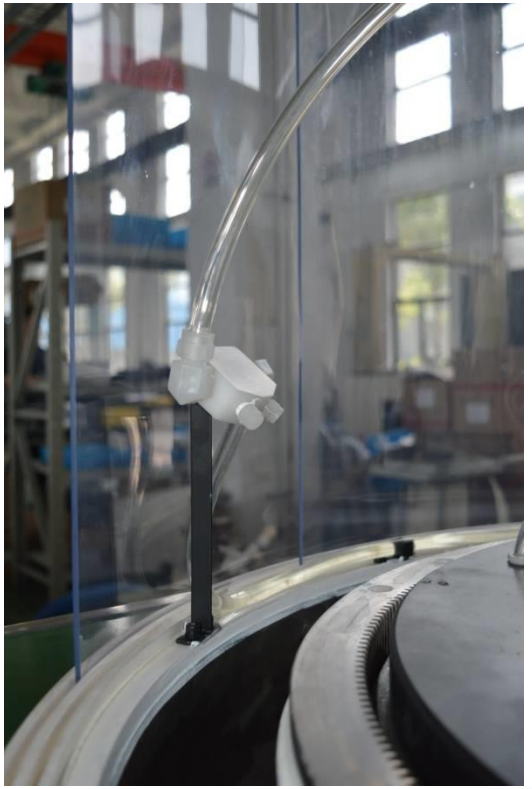
- Electrical system:
- Mitsubishi Series PLC 三菱电机 MITSUBISHI ELECTRIC
- Mitsubishi series frequency converters
- Mitsubishi human-machine interface

- dynamical system：
- Taiwan TECO Electric TECO
- Self-made high-precision reducer

Physical photos
Gallium arsenide is ground with 9B double-sided grinding

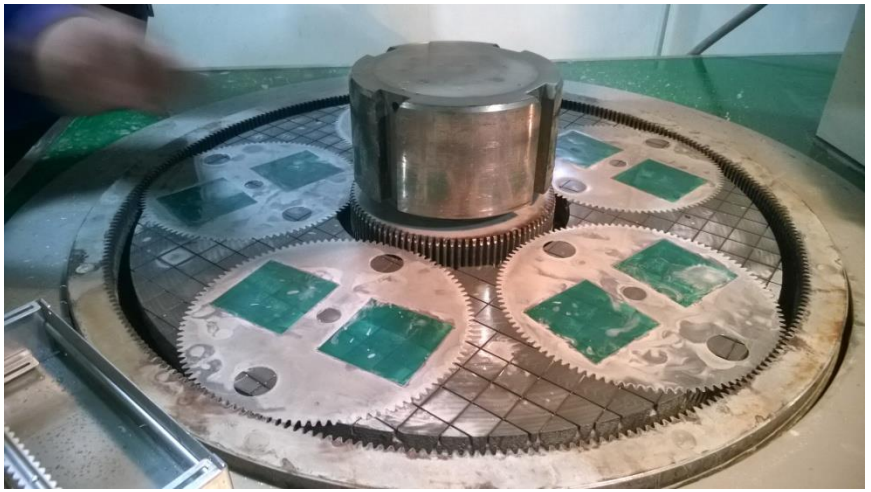






Physical photos

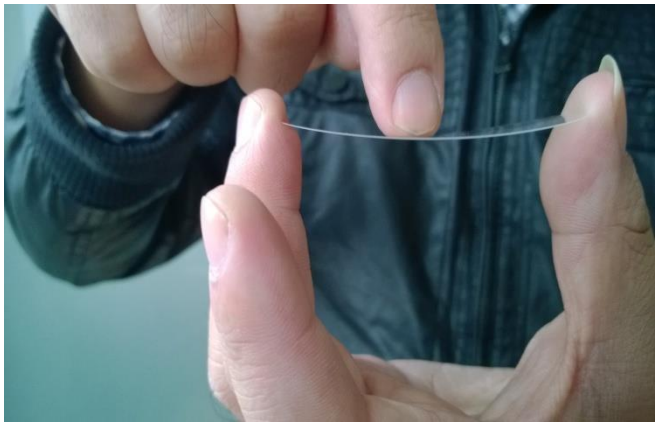






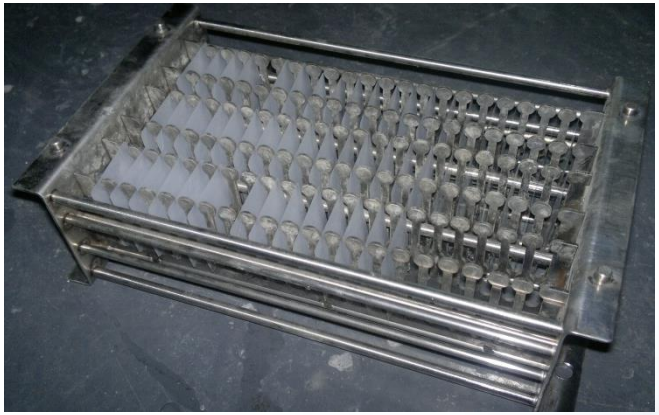
9B/9.6B Typical machining cases





Φ62×0.08㎜ 水晶抛光片





0.032㎜ 水晶高频片

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9B/9.6B Typical machining cases



0.085mm Zirconia ceramic sheet grinding



0.085mm Zirconia ceramic sheet polished

9B/9.6B Typical machining cases







77X70X0.07mm Crystal flakes are ground and polished

9B/9.6B Typical machining cases



55X55X0.1mm Ceramic sheets are ground and polished

13B-6LP-3M/13.9B-9LP-3M
Double-sided grinder/polisher



- Dimensions: L2200× W1835× H2822mm
- Weight：4600kg
- Features: 3 motor drive, upper and lower plates, ring gear, center gear independent drive; It can also be configured with a four-motor drive.
- Programmable controller PLC + touch screen;
- 20 different processing processes can be stored;
- The positive rotation of the fixture and the reversal of the fixture are used interactively to realize the automatic correction of the disk surface in the work.
- The CPU itself allocates the speed of the upper and lower plates, the center gear, and the ring gear, and can also manually set the appropriate speed, which can facilitate the operator to better design the rotation and rotation trajectory of the workpiece, set any rotation and rotation ratio, and achieve the best processing conditions and the best processing results.
- Precision load cell to achieve controllable pressure on the plate to ensure the safety of the workpiece when the plate is dropped. The whole pressure closed-loop feedback compensates the pressure value in real time to ensure the accuracy of the pressure;
- 3 motor drive, and the use of CC-LINK communication protocol, to the greatest extent to eliminate the impact of excess load, significantly extend the life of the fixture, ring of gear, center gear;

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13B/13.9B parameter

Model		13B-5L/P	13B-6L/P	13.9B-9L/P
Upper and lower plate sizes	Grind（mm）	Φ849× Φ273×t40	Φ927× Φ358×t40	Φ923× Φ515×t40
	Polished（mm）	Φ858× Φ264×t40	Φ933× Φ349×t40	Φ933× Φ505×t40
Fixture parameters	Modulus	DP12	DP12	DP12/M2
	Number of teeth（Z）	Z147	Z147	Z108/Z114
	Pitch Circle（mm）	311.15	311.15	228.6
Drive mode	2motor	×	×	×
	3motor	●	●	●
	4motor	●	●	●
Number of fixtures		5	6	9
Maximum machining diameter（mm）		210	210	150
Maximum processing thickness（mm）		66	66	66
Thinnest processing thickness（mm）		0.12	0.12	0.12

Our products are different from other products on the market



morinaga 13.9B machine

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Other 13.9B machine

Our products are different from other products on the market

NO.	Morinaga 13B	Other 13B	Our advantages
1	3-MOTOR drive 4-MOTOR drive	2-MOTOR drive 3-MOTOR drive	Reduced vibration, improved stability, improved adaptability of fixtures, not easy to crack, so that thinner workpieces can be produced;
2	Adaptive pressure feedback system	Mechanical counterweight system	The pressure of falling and starting plate can be adjusted to eliminate excess impact to the greatest extent and improve the yield rate;
3	The rotation ratio of the swimming fixture is adjustable	The rotation ratio of the fixture is fixed	Diversification of process parameters can be achieved without changing the mechanical transmission ratio;
4	10 inch Mitsubishi touch screen	There is no touch screen	The picture is clearer, easy to operate, and has a long service life
5	The inner and outer ring gears are raised and lowered electrically at the same time	The inner and outer ring gears cannot be lifted or lowered individually	Extend the service life of the outer ring gear and the sun teeth, and improve the success rate of extremely thin workpieces;
6	Mitsubishi series inverters	Generic brand elements	Fast response, long service life, easy to install and maintain
7	CC-LINK communication	RS485	The motor reaction speed is more sensitive, the torque output is more gentle, and the workpiece crushing rate is low. The motor output speed is adjusted in real time to ensure an accurate rotation/rotation ratio
8	Dual cylinder pressurization	Single cylinder pressurization	The large cylinder is responsible for rapid movement, the small cylinder adopts a special low-friction cylinder, which is responsible for the accurate output of pressure, and the small cylinder compresses the gas volume and the pressure control is more precise
9	Scalable to13B/14B/15B	Not scalable	The equipment is versatile and the investment risk is small
10	NSK bearings SMC、CKD Pneumatic	Generic brand elements	High precision and long life

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13B/13.9B Major component brands

- **bearing**：Japan NSK
-
- **Pneumatic components :** CKD SMC
- Main cylinder：Japan CKD special injection low friction cylinder
- ITV, precision pressure regulator, speed control valve： Japan
- Solenoid valves, pressure reducing valves: Japan

- Electrical system:
- Mitsubishi Series PLC 三菱电机 MITSUBISHI ELECTRIC
- Mitsubishi series frequency converters
- Mitsubishi human-machine interface

- dynamical system：
- Taiwan TECO Electric TECO
- Self-made high-precision reducer

Physical photos



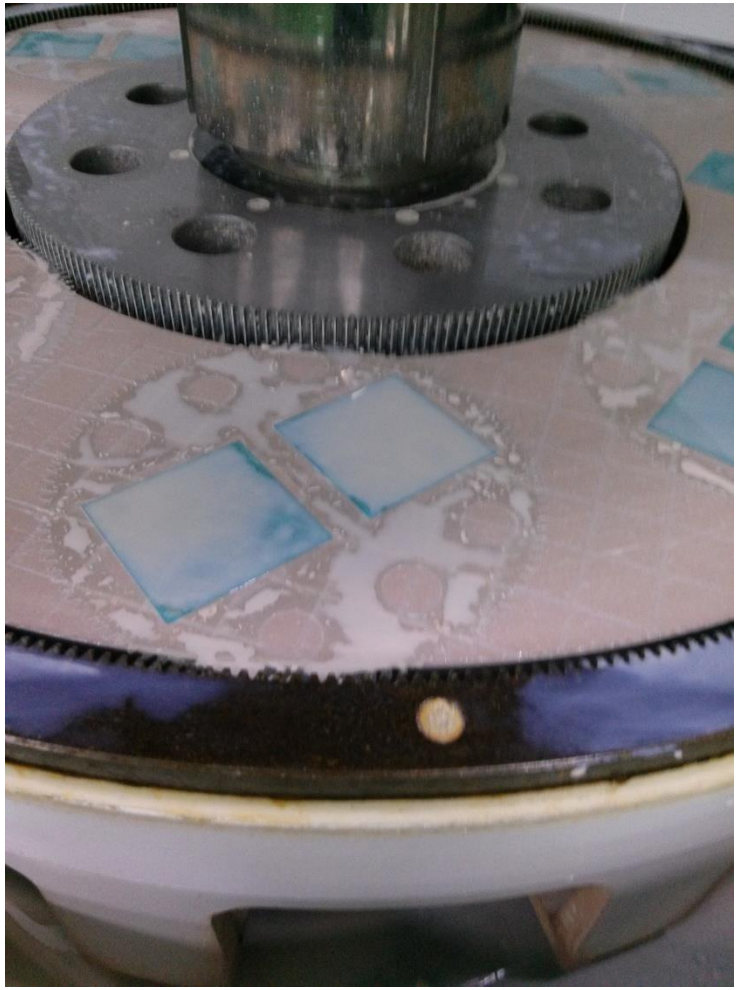
Physical photos



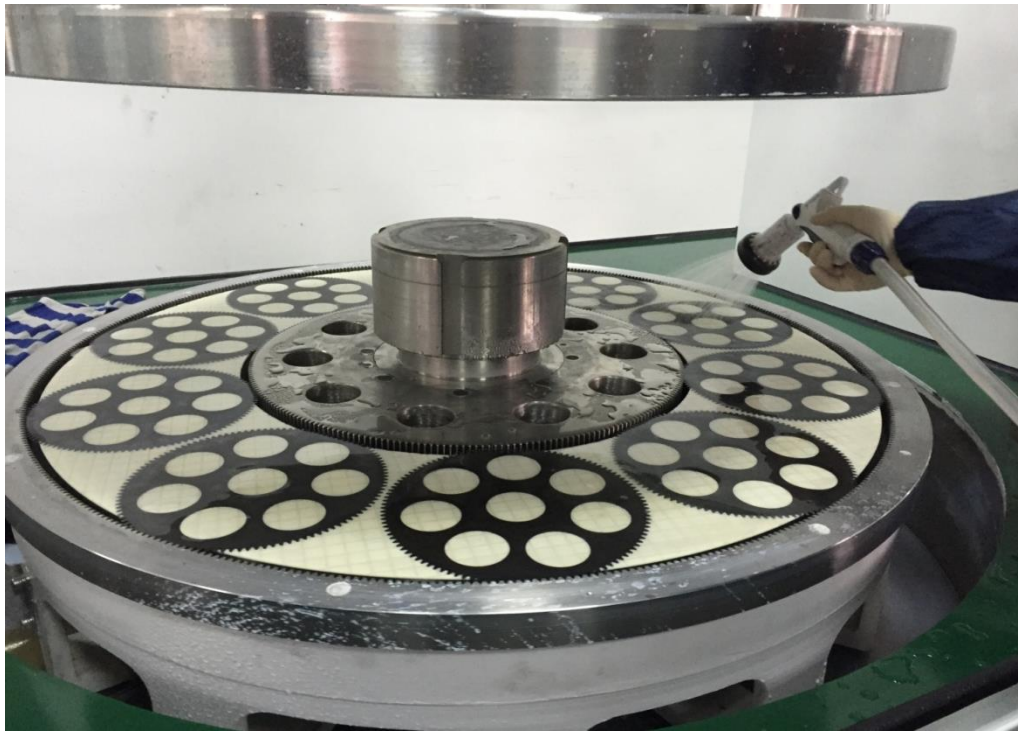
Physical photos



Physical photos



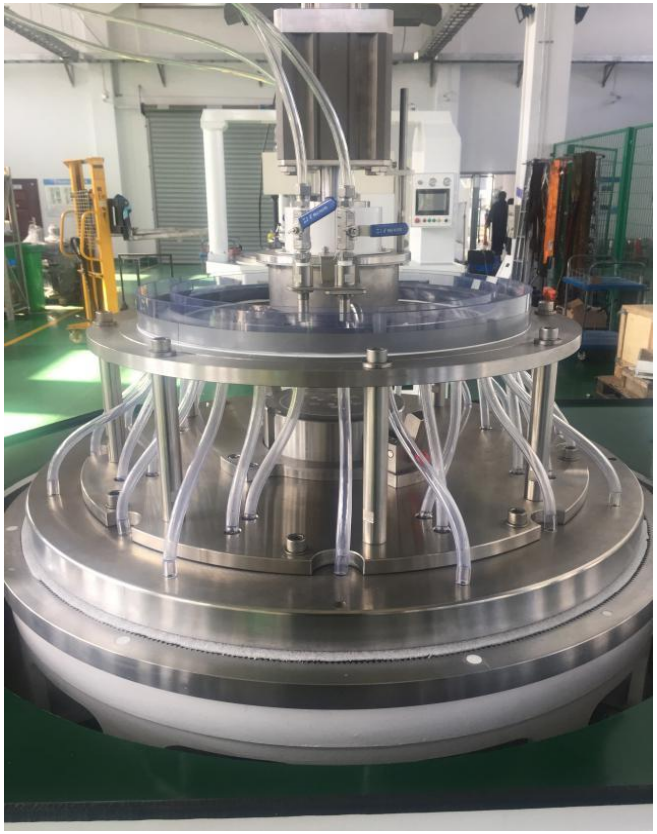
Physical photos





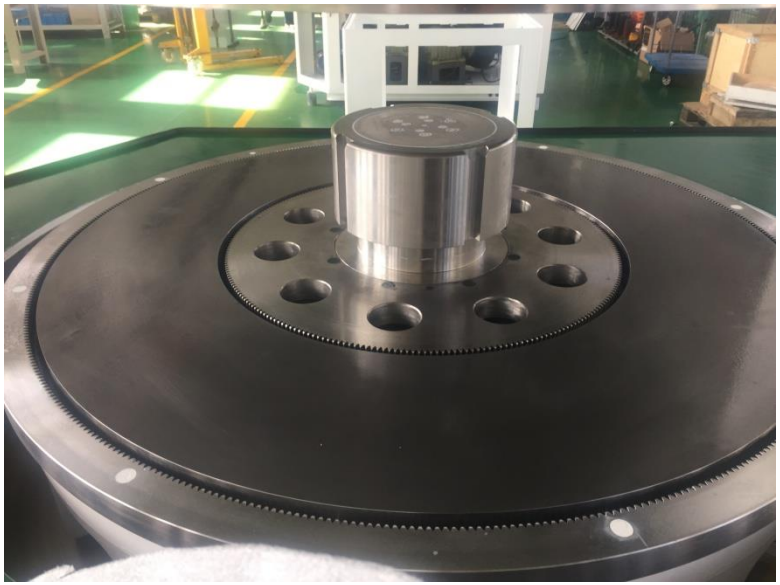
2寸0.17毫米蓝宝石抛光片

Cosmetic characteristics of grinding and polishing machines



1. Plate plating, or stainless steel, corrosion resistant design;
2. Automatic water nozzle for easy cleaning and polishing leather trimming;
3. The gear ring and the machine body leave cleaning space, which is convenient for cleaning the debris and crystallization inside the machine;

Cosmetic characteristics of grinding and polishing machines





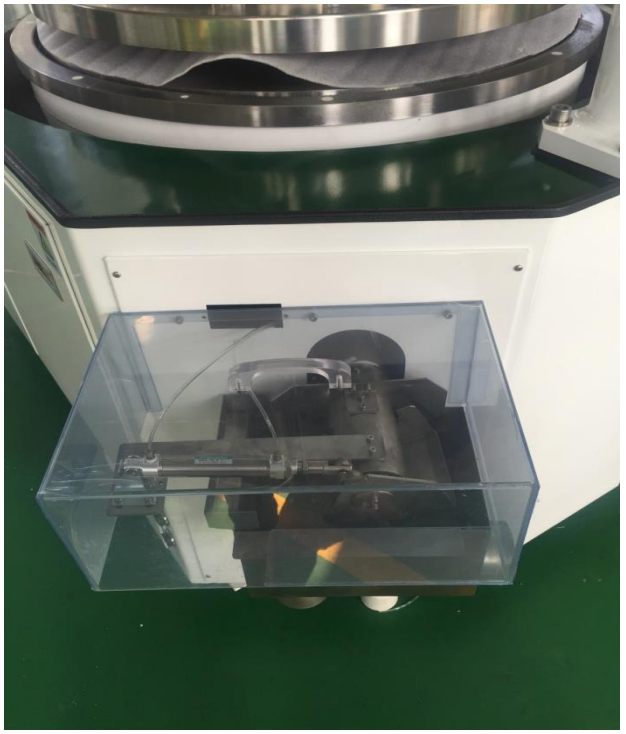
Polishing machine:
The flatness of the polished polish disc is within 0.01 mm；
It can be used directly on the skin；

Grinder:
High quality ductile iron grinding discs；
45# Forging outer ring gear and center teeth;

Cosmetic characteristics of grinding and polishing machines



The cooling fan greatly reduces the temperature of the main motor during continuous operation;
Ideal for polishing in the sapphire industry;



Polishing fluid and water automatic switching system; ;

16B-5L/P-4M
Double-sided grinder/polisher



- Dimensions: L2150*W1429*H2800mm
- Weight：5500kg
- Features: 4 motor drive, upper plate, lower plate, ring gear, center gear independent drive;
- Programmable controller PLC + touch screen;
- 20 different processing processes can be stored;
- The positive rotation of the fixture and the reversal of the fixture are used interactively to realize the automatic correction of the disk surface in the work.
- The CPU itself allocates the speed of the upper and lower plates, the center gear, and the ring gear, and can also manually set the appropriate speed, which can facilitate the operator to better design the rotation and rotation trajectory of the workpiece, set any rotation and rotation ratio, and achieve the best processing conditions and the best processing results.
- Precision load cell to achieve controllable pressure on the plate to ensure the safety of the workpiece when the plate is dropped. The whole pressure closed-loop feedback compensates the pressure value in real time to ensure the accuracy of the pressure;
- 4 motor drive, and the use of CC-LINK communication protocol, to the greatest extent to eliminate the impact of excess load, significantly extend the life of the fixture, ring of gear, center gear;

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16B 参数

- 机械参数：
- 研 磨 盘： 球墨铸铁 FCD450 φ1144 × φ355 ×t50㎜ 材质可选HT300
- 抛 光 盘： 不锈钢 SUS304 φ1154 × φ364 × t50 ㎜ 材质可选其它
- 游星轮： M3 × Z142 / DP12 × Z200 模数可选英制
- 游星轮数量：5片/组
- 最大加工工件尺寸：Φ350㎜
-

动力：

- 4马达驱动 ：
- 上定盘 7.5KW 11KW(蓝宝石专机）
- 下定盘 7.5KW 11KW(蓝宝石专机）
- 齿 圈 2.2KW
- 太阳齿 1.5KW
-
- 转速
- 上定盘： 0～30RPM 下定盘 ：0～60RPM
- 太阳齿 ：0～27RPM 外齿圈: 0～22RPM

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16B parameter

Model		16B-5L/P
Upper and lower plate sizes	Grind（mm）	Φ1144×Φ355×t50
	Polished（mm）	Φ1154×Φ364×t50
Fixture parameters	Modulus	DP12/M3
	Number of teeth（Z）	Z200/Z142
	Pitch Circle（mm）	423.3/426
Drive mode	2motor	×
	3motor	×
	4motor	●
Number of fixtures		5
Maximum machining diameter（mm）		356
Maximum processing thickness（mm）		66

Troysupply.com

Our products are different from other products on the market



morinaga 16B machine



Other 16B machine

Our products are different from other products on the market

NO.	Morinaga 16B	Other 16B	Our advantages
1	4-MOTOR drive	2-MOTOR drive 3-MOTOR drive	Reduced vibration, improved stability, improved adaptability of fixtures, not easy to crack, so that thinner workpieces can be produced;
2	Adaptive pressure feedback system	Mechanical counterweight system	The pressure of falling and starting plate can be adjusted to eliminate excess impact to the greatest extent and improve the yield rate;
3	The rotation ratio of the swimming fixture is adjustable	The rotation ratio of the fixture is fixed	Diversification of process parameters can be achieved without changing the mechanical transmission ratio;
4	10 inch Mitsubishi touch screen	There is no touch screen	The picture is clearer, easy to operate, and has a long service life
5	The inner and outer ring gears are raised and lowered electrically at the same time	The inner and outer ring gears cannot be lifted or lowered individually	Extend the service life of the outer ring gear and the sun teeth, and improve the success rate of extremely thin workpieces;
6	Mitsubishi series inverters	Generic brand elements	Fast response, long service life, easy to install and maintain
7	CC-LINK communication	RS485	The motor reaction speed is more sensitive, the torque output is more gentle, and the workpiece crushing rate is low. The motor output speed is adjusted in real time to ensure an accurate rotation/rotation ratio
8	Dual cylinder pressurization	Single cylinder pressurization	The large cylinder is responsible for rapid movement, the small cylinder adopts a special low-friction cylinder, which is responsible for the accurate output of pressure, and the small cylinder compresses the gas volume and the pressure control is more precise
9	Scalable to13B/14B/15B	Not scalable	The equipment is versatile and the investment risk is small
10	NSK bearings SMC、CKD Pneumatic	Generic brand elements	High precision and long life

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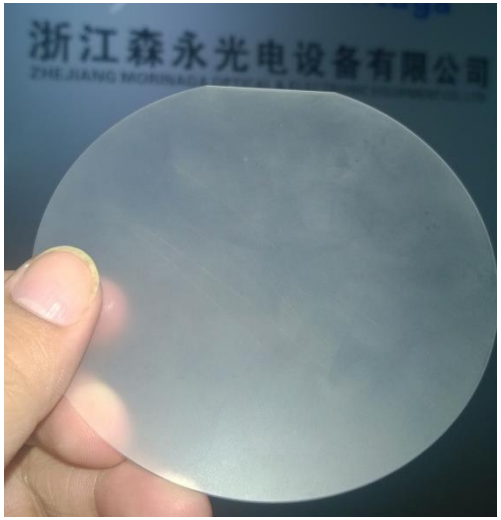
13B/13.9B Major component brands

- **bearing**：Japan NSK
-
- **Pneumatic components :** CKD SMC
- Main cylinder：Japan CKD special injection low friction cylinder
- ITV, precision pressure regulator, speed control valve： Japan
- Solenoid valves, pressure reducing valves: Japan

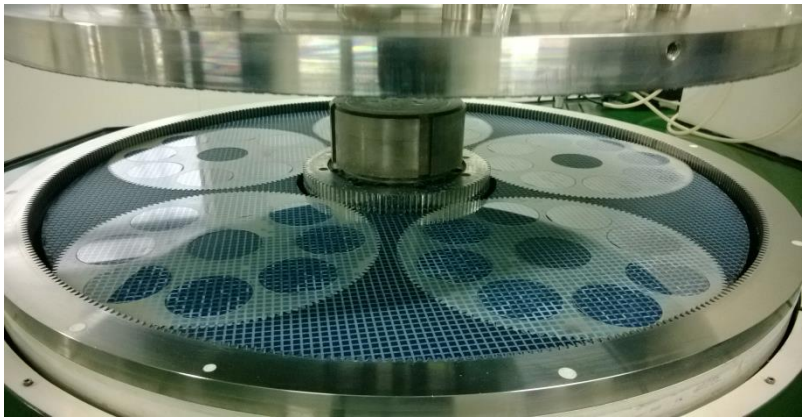
- Electrical system:
- Mitsubishi Series PLC 三菱电机 MITSUBISHI ELECTRIC
- Mitsubishi series frequency converters
- Mitsubishi human-machine interface

- dynamical system：
- Taiwan TECO Electric TECO
- Self-made high-precision reducer

16B Typical machined workpieces



4″ Sapphire grind

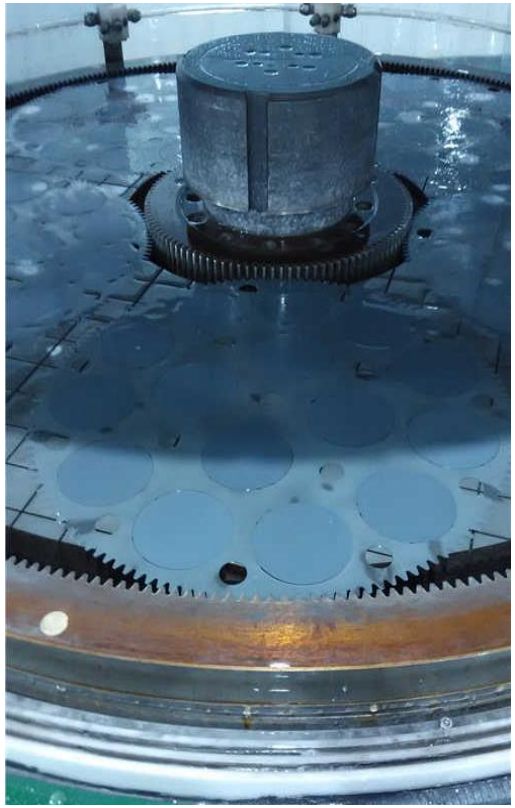


4″ Sapphire polishing

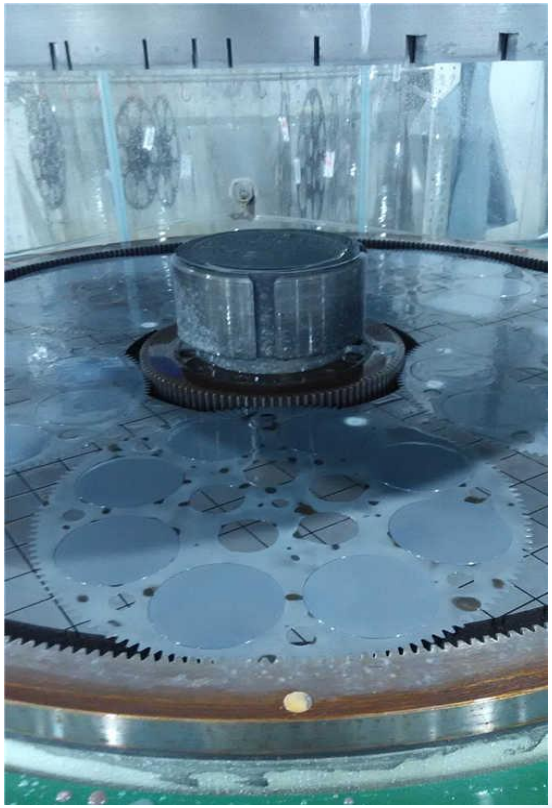
16B Typical machined workpieces （silicon wafer ）



16B Silicon wafer with 4 motors

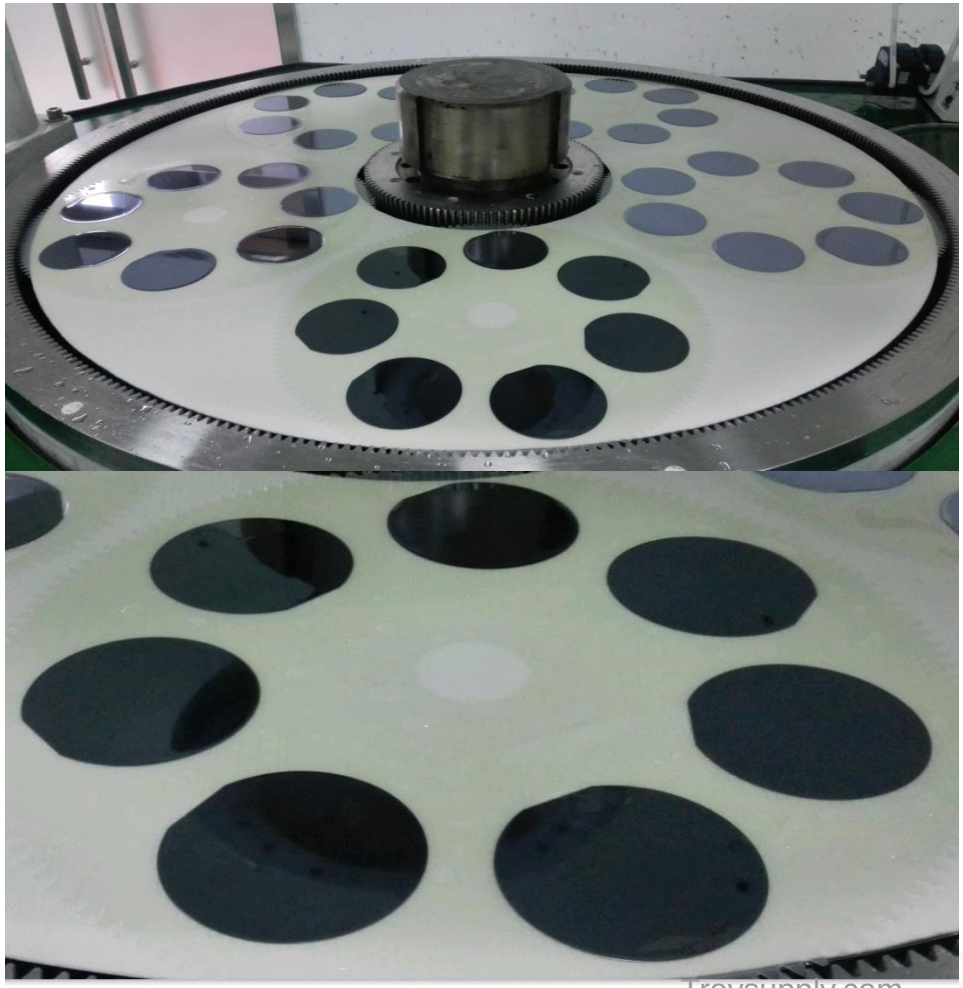


16B Grind 3" wafers



16B Grind 4" wafers

16B Typical machined workpieces （Gallium arsenide wafer ）

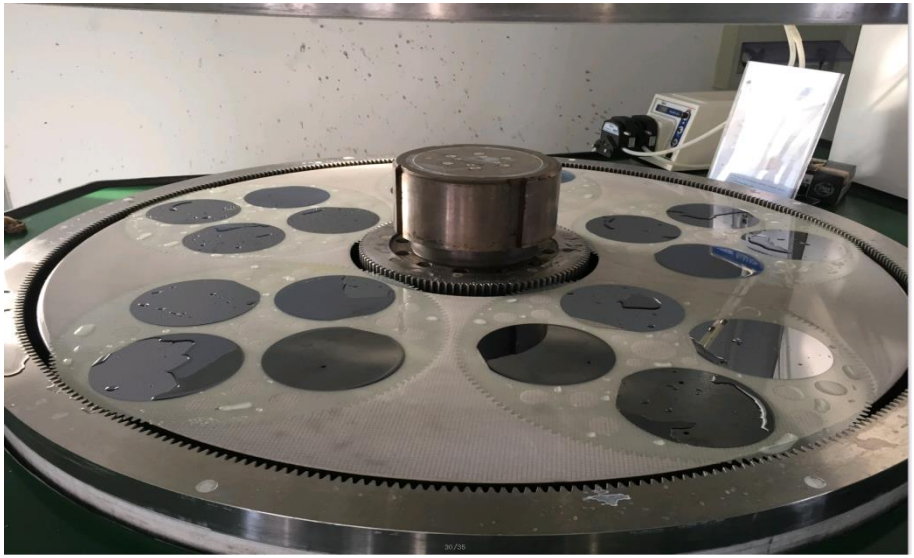


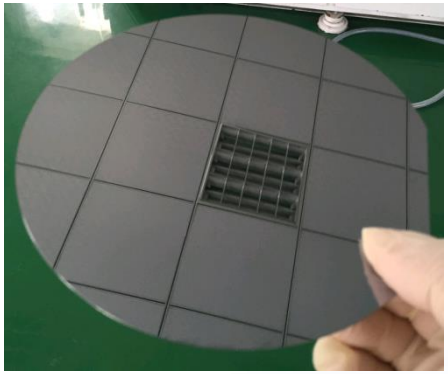


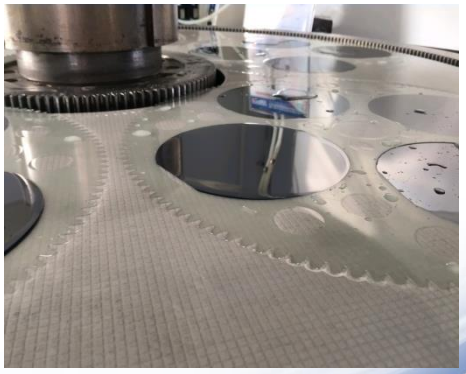
Troysupply.com

16B Typical machined workpieces （Polished 6 inch silicon wafer ）





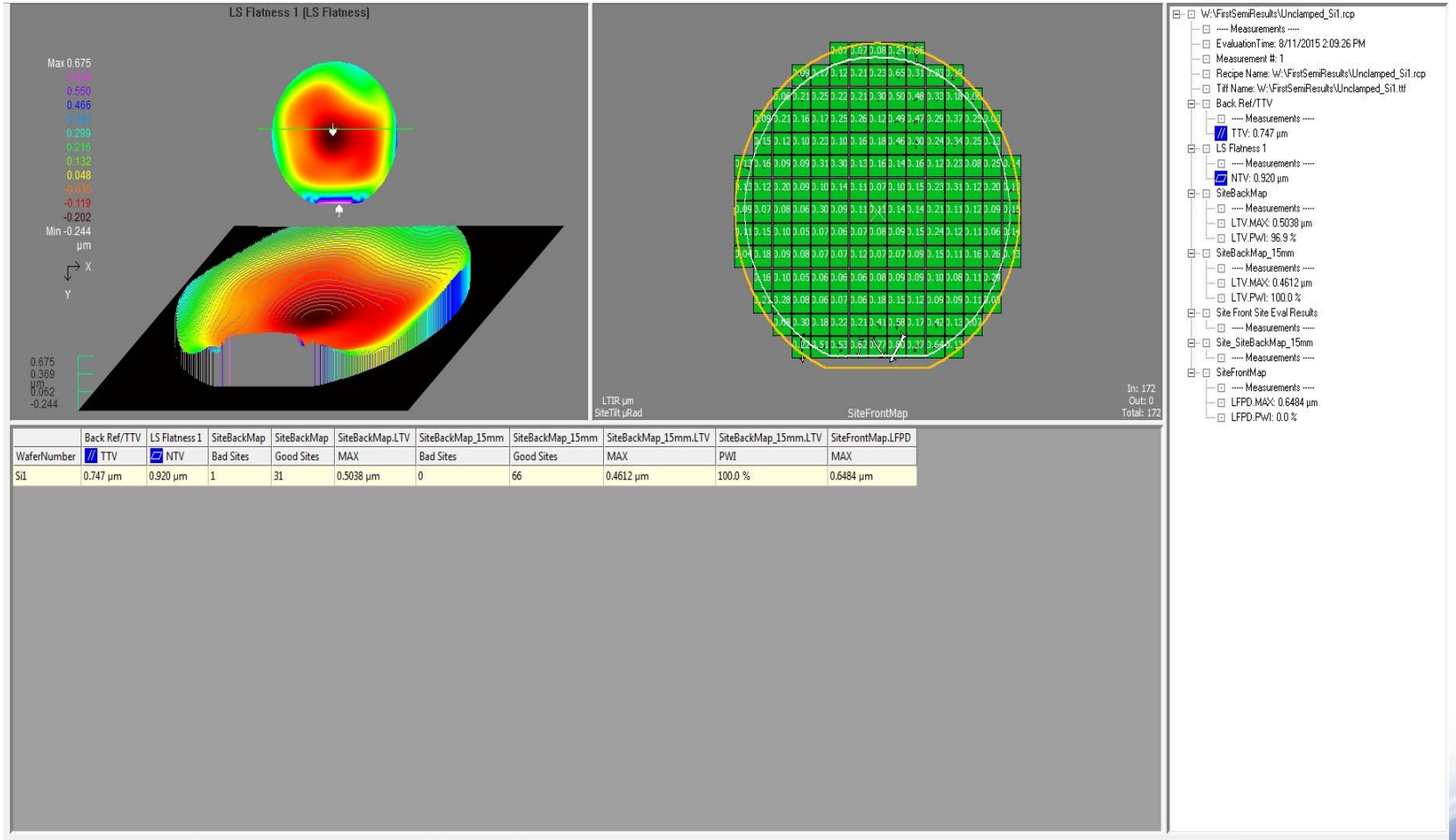




16B Typical machined workpieces （Polished 6 inch silicon wafer ）

- remark：
- The test object: 6 inch silicon wafer
- Thickness: 0.485mm
- Quantity: 20 tablets
- Sampling quantity: 3 tablets
- Location of detection: United States
-

16B Typical machined workpieces （Polished 6 inch silicon wafer ） （6 inch silicon wafer polishing sampling sheet 1）



	Back Ref/TTV	LS Flatness 1	SiteBackMap	SiteBackMap	SiteBackMap.LTV	SiteBackMap_15mm	SiteBackMap_15mm	SiteBackMap_15mm.LTV	SiteBackMap_15mm.LTV	SiteFrontMap.LFPD
WaferNumber	TTV	NTV	Bad Sites	Good Sites	MAX	Bad Sites	Good Sites	MAX	PWI	MAX
Si1	0.747 µm	0.920 µm	1	31	0.5038 µm	0	66	0.4612 µm	100.0 %	0.6484 µm

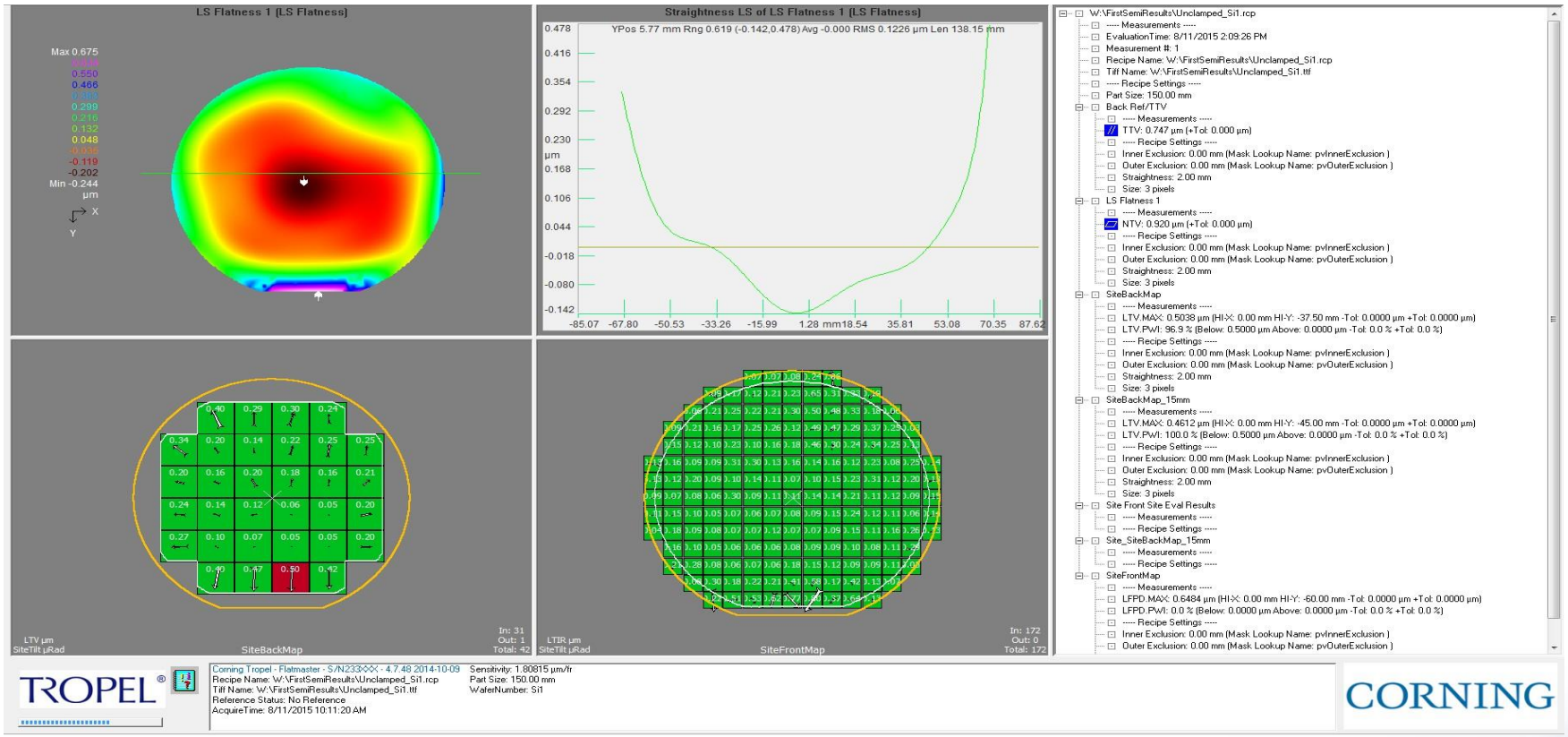
TROPEL®

Corning Tropel - Flatmaster - S/N233XXX - 4.7.48 2014-10-09
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Sensitivity: 1.80815 µm/fr
Part Size: 150.00 mm
WaferNumber: Si1

Troysupply.com

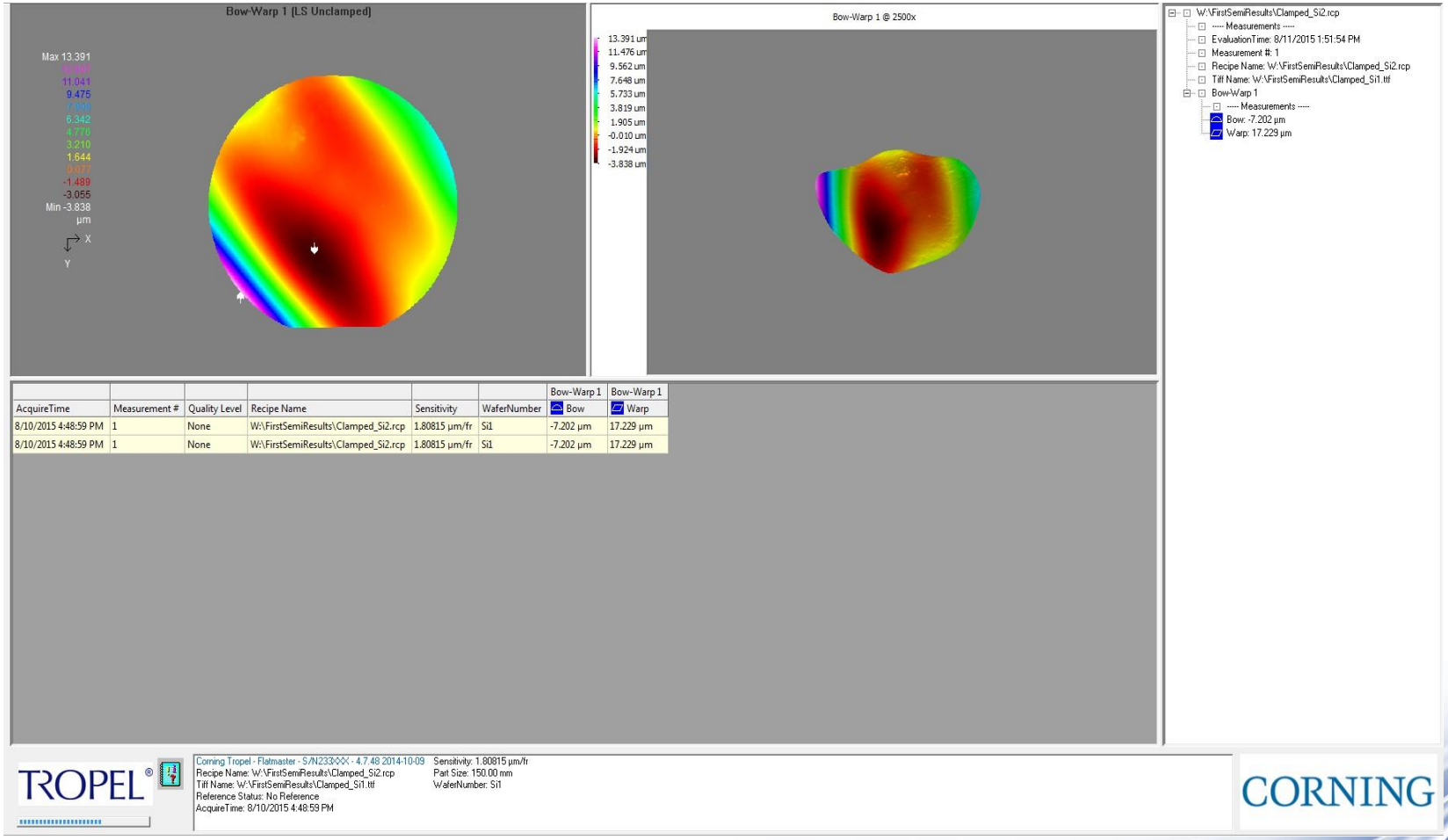
CORNING

16B Typical machined workpieces （Polished 6 inch silicon wafer ） （6 inch silicon wafer polishing sampling sheet 1）



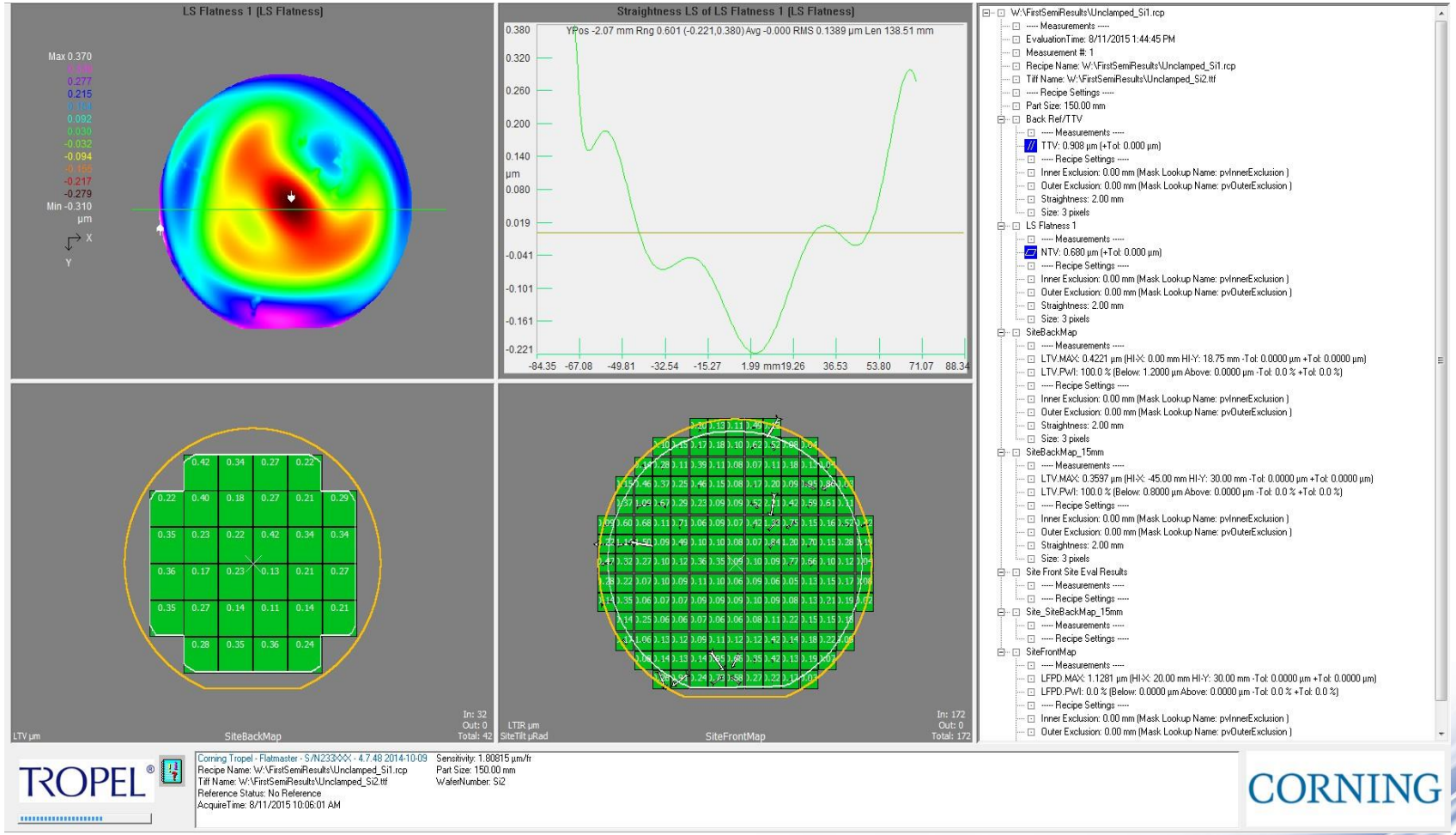
Troysupply.com

16B Typical machined workpieces （Polished 6 inch silicon wafer ） （6 inch silicon wafer polishing sampling sheet 1）



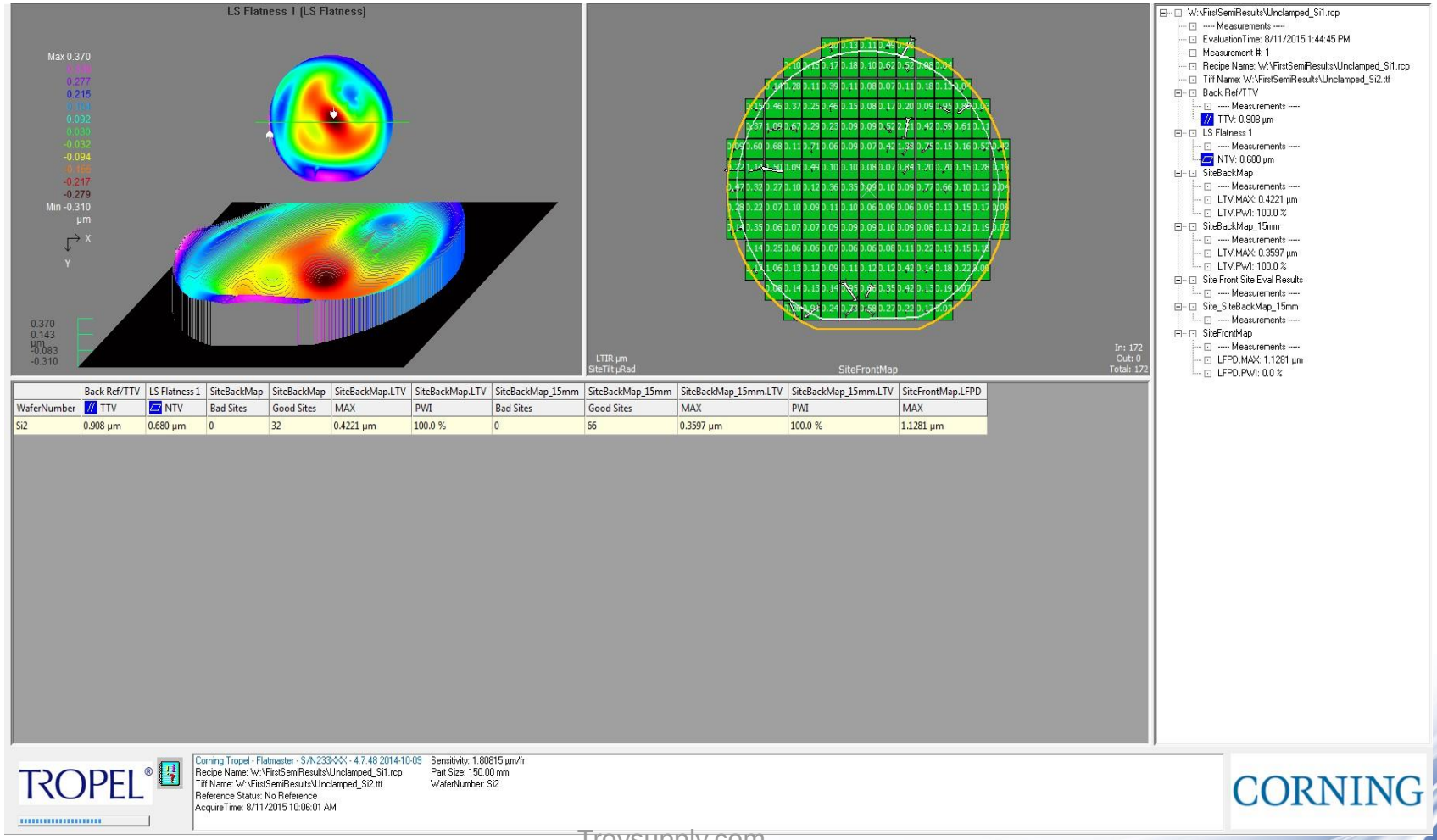
Troysupply.com

16B Typical machined workpieces （Polished 6 inch silicon wafer ） （6 inch silicon wafer polishing sampling sheet 2）



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16B Typical machined workpieces （Polished 6 inch silicon wafer ） （6 inch silicon wafer polishing sampling sheet 2）



	Back Ref/TTV	LS Flatness 1	SiteBackMap	SiteBackMap	SiteBackMap.LTV	SiteBackMap.LTV	SiteBackMap_15mm	SiteBackMap_15mm	SiteBackMap_15mm.LTV	SiteBackMap_15mm.LTV	SiteFrontMap.LFPD
WaferNumber	TTV	NTV	Bad Sites	Good Sites	MAX	PWI	Bad Sites	Good Sites	MAX	PWI	MAX
Si2	0.908 µm	0.680 µm	0	32	0.4221 µm	100.0 %	0	66	0.3597 µm	100.0 %	1.1281 µm

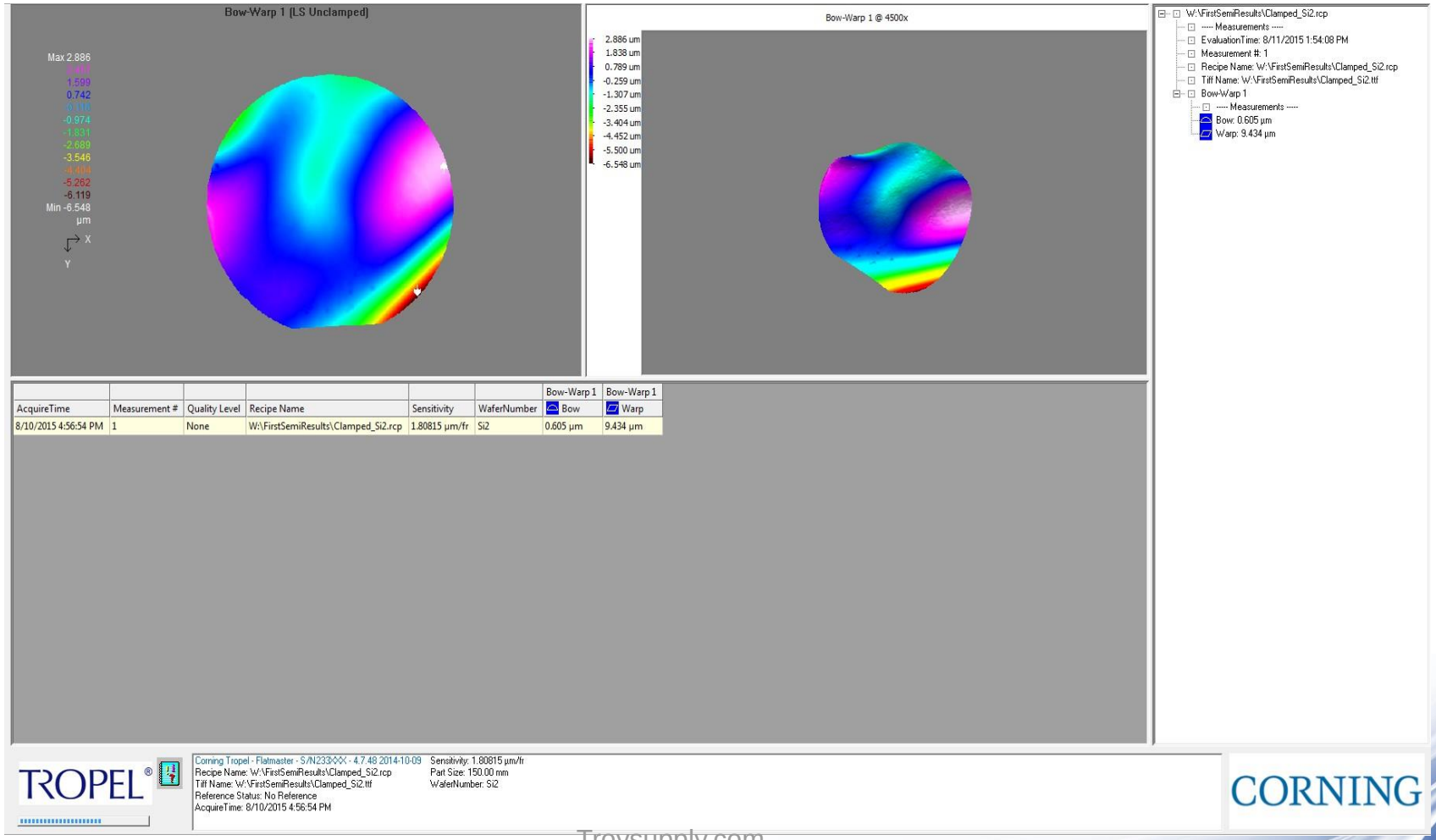
TROPEL®

Corning Tropel - Flatmaster - S/N233-XXX - 4.7.48 2014-10-09
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Part Size: 150.00 mm
WaferNumber: Si2

CORNING

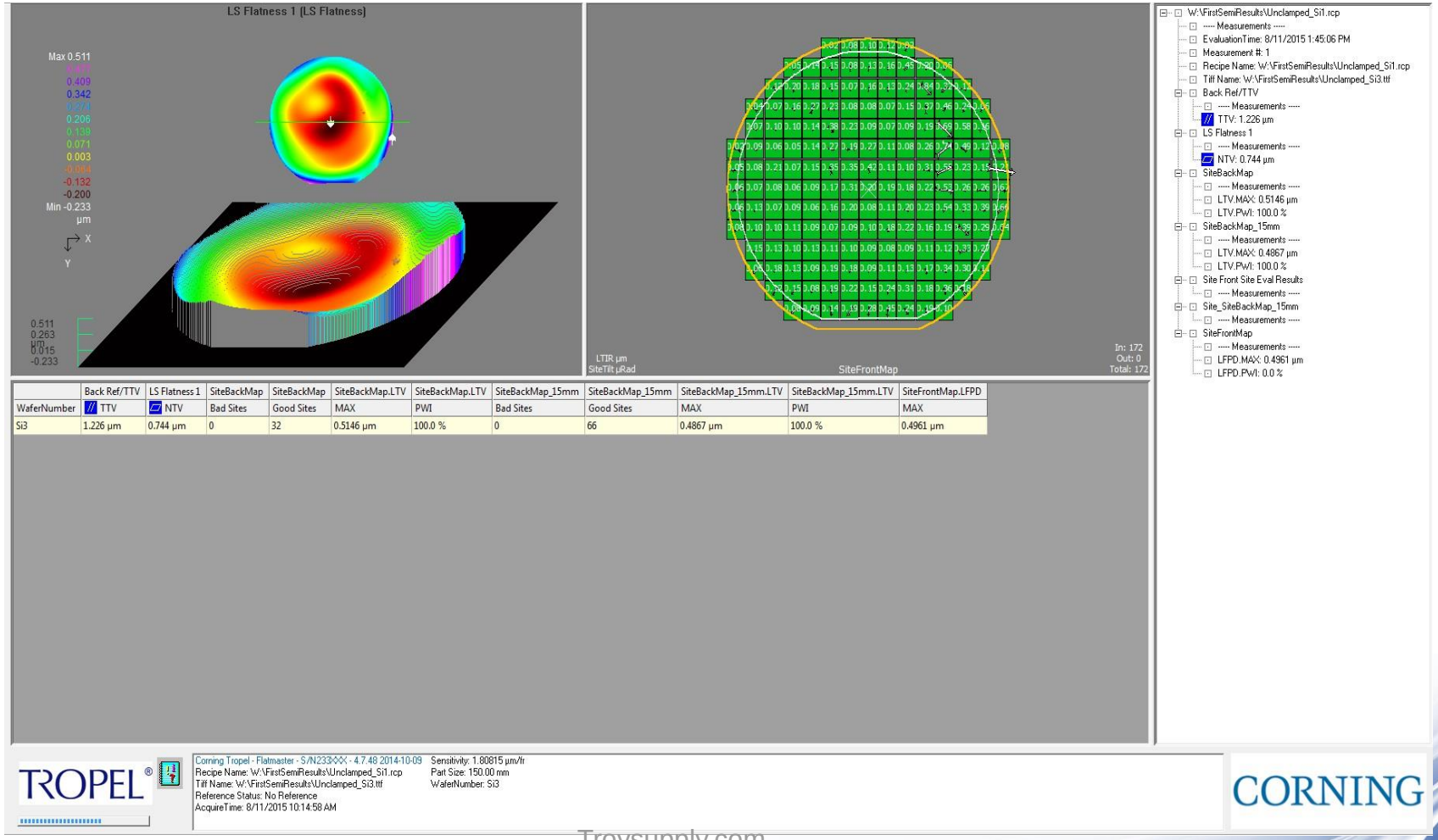
Troysupply.com

16B Typical machined workpieces （Polished 6 inch silicon wafer ）（6 inch silicon wafer polishing sampling sheet 2）



Troysupply.com

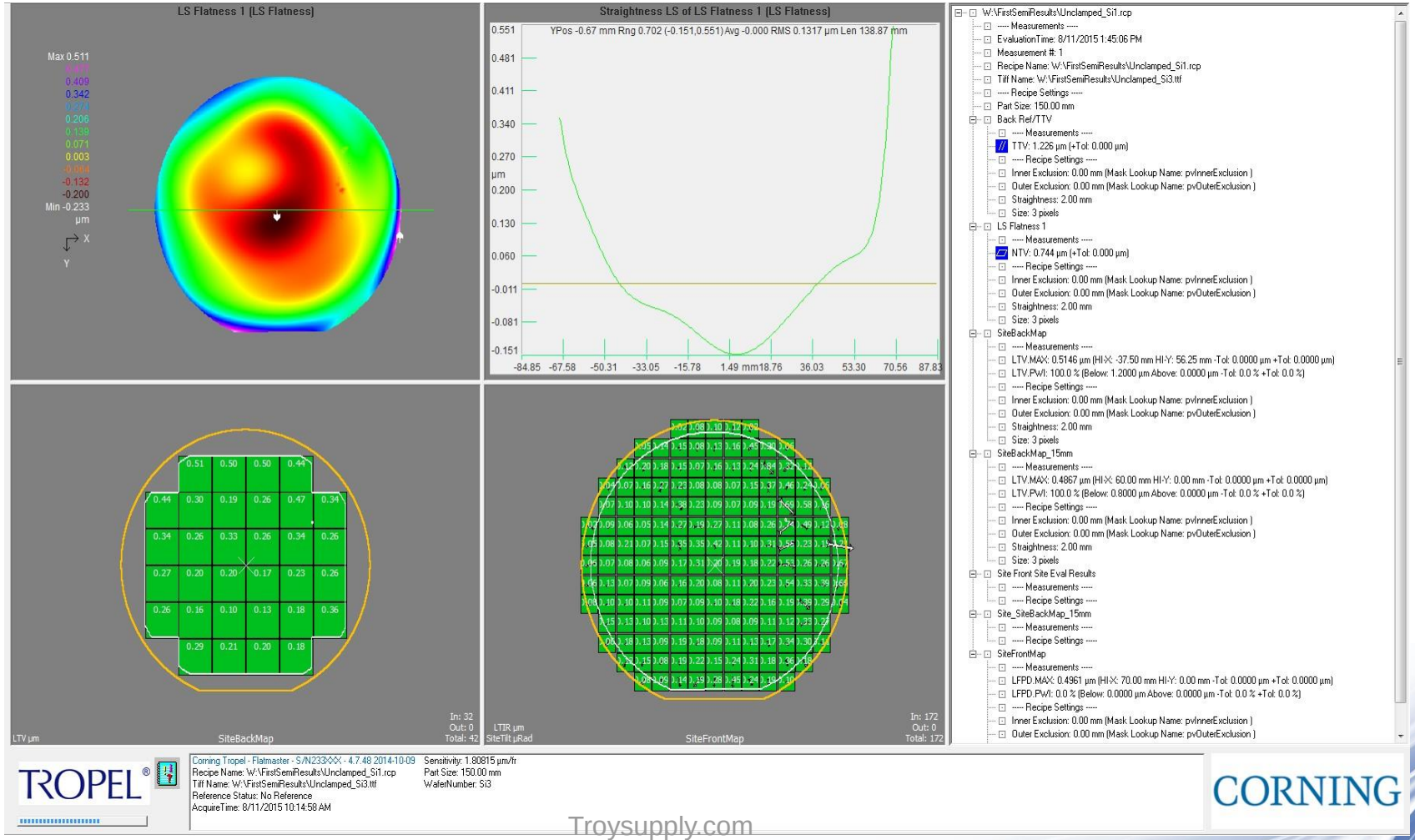
16B Typical machined workpieces （Polished 6 inch silicon wafer ）（6 inch silicon wafer polishing sampling sheet 3）



	Back Ref/TTV	LS Flatness 1	SiteBackMap	SiteBackMap	SiteBackMap.LTV	SiteBackMap.LTV	SiteBackMap_15mm	SiteBackMap_15mm	SiteBackMap_15mm.LTV	SiteBackMap_15mm.LTV	SiteFrontMap.LFPD
WaferNumber	TTV	NTV	Bad Sites	Good Sites	MAX	PWI	Bad Sites	Good Sites	MAX	PWI	MAX
Si3	1.226 µm	0.744 µm	0	32	0.5146 µm	100.0 %	0	66	0.4867 µm	100.0 %	0.4961 µm

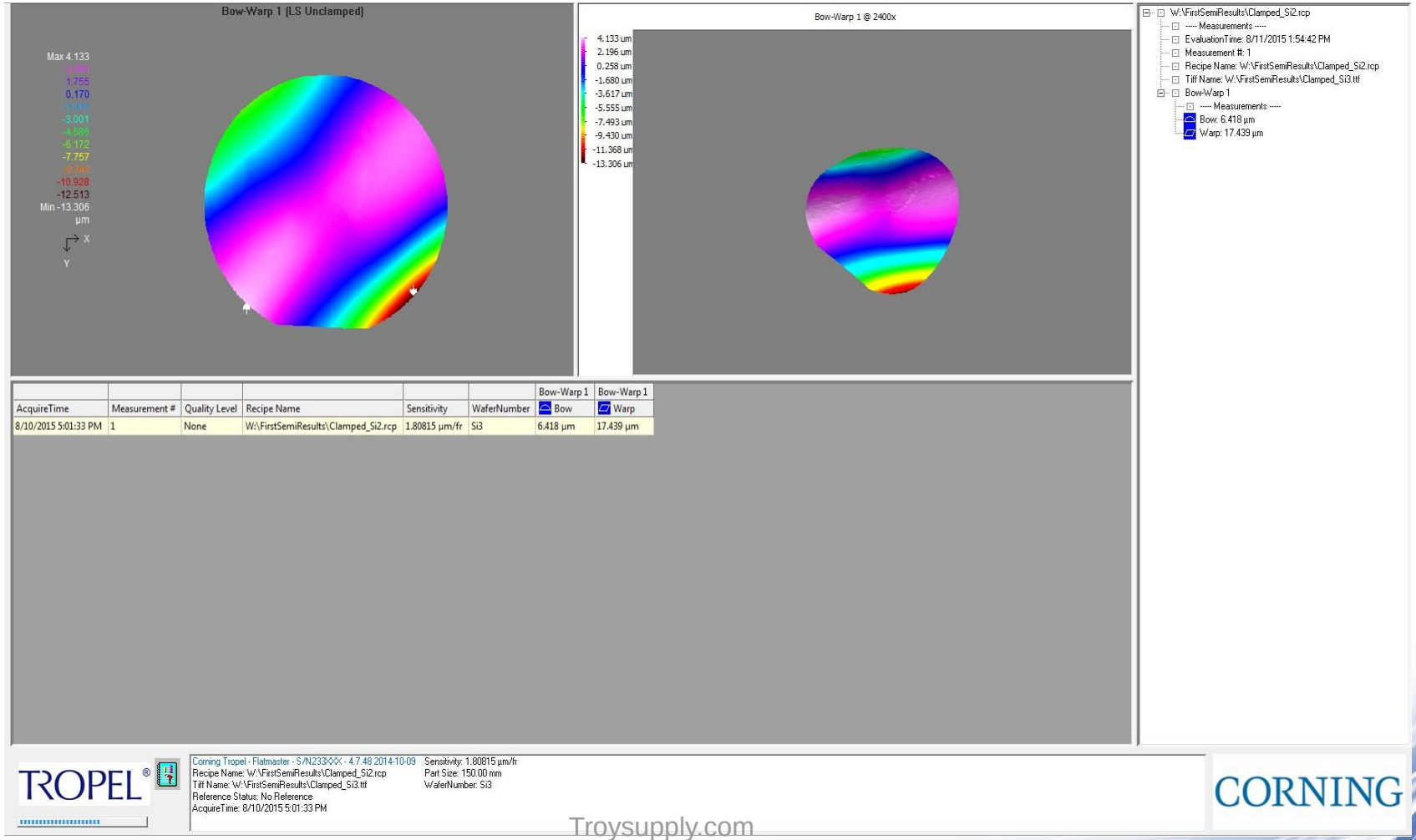
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16B Typical machined workpieces （Polished 6 inch silicon wafer ） （6 inch silicon wafer polishing sampling sheet 3）



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16B Typical machined workpieces （Polished 6 inch silicon wafer ） （6 inch silicon wafer polishing sampling sheet 3）



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16B Typical machined workpieces （Polished 6 inch silicon wafer ）

- remark：
- The test object: 6 inch silicon wafer
- Thickness: 0.485mm
- Quantity: 20 tablets
- Sampling quantity: 3 tablets
- Location of detection: United States

16B Customer site (grinding)



16B Customer site (polishing)



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16B Customer site



16B Gallium arsenide polishing machine





18B/20B/21B/22B
High precision double-sided grinding/polishing machine



- Dimensions: L2200*W1835*H2822mm
- Weight：9000kg
- Features: 4 motor drive, upper plate, lower plate, ring gear, center gear independent drive;
- Programmable controller PLC + touch screen;
- 20 different processing processes can be stored;
- The positive rotation of the fixture and the reversal of the fixture are used interactively to realize the automatic correction of the disk surface in the work.
- The CPU itself allocates the speed of the upper and lower plates, the center gear, and the ring gear, and can also manually set the appropriate speed, which can facilitate the operator to better design the rotation and rotation trajectory of the workpiece, set any rotation and rotation ratio, and achieve the best processing conditions and the best processing results.
- Precision load cell to achieve controllable pressure on the plate to ensure the safety of the workpiece when the plate is dropped. The whole pressure closed-loop feedback compensates the pressure value in real time to ensure the accuracy of the pressure;
- 4 motor drive, and the use of CC-LINK communication protocol, to the greatest extent to eliminate the impact of excess load, significantly extend the life of the fixture, ring of gear, center gear;

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22B parameter

Model		18B-5L/P	20B-5L/P	21B-5L/P	22B-5L/P
Upper and lower plate sizes	Grind（mm）	1260×460×45	1355×458×50	1405×464×50	1456×488×50
	Polished（mm）	1290×426×40	1380×432×40	1428×438×40	1492×452×50
Fixture parameters	Modulus	M3	M3	M3	M3
	Number of teeth（Z）	Z154	Z170	Z177	Z184
	Pitch Circle（mm）	462	510	531	552
Drive mode		4motor	4motor	4motor	4motor
Number of fixtures		5	5	5	5
Maximum machining diameter（mm）		390	410	425	480
Maximum processing thickness（mm）		30	30	30	30

22B Major component brands

- **bearing**：Japan NSK
-
- **Pneumatic components :** CKD SMC
- Main cylinder：Japan CKD special injection low friction cylinder
- ITV, precision pressure regulator, speed control valve： Japan
- Solenoid valves, pressure reducing valves: Japan

- Electrical system:
- Mitsubishi Series PLC 三菱电机 MITSUBISHI ELECTRIC
- Mitsubishi series frequency converters
- Mitsubishi human-machine interface

- dynamical system：
- Taiwan TECO Electric TECO
- Self-made high-precision reducer

Our products are different from other products on the market



morinaga 22B machine



Other 22B machine

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Our products are different from other products on the market

NO.	Morinaga 16B	Other 16B	Our advantages
1	4-MOTOR drive	2-MOTOR drive 3-MOTOR drive	Reduced vibration, improved stability, improved adaptability of fixtures, not easy to crack, so that thinner workpieces can be produced;
2	Adaptive pressure feedback system	Mechanical counterweight system	The pressure of falling and starting plate can be adjusted to eliminate excess impact to the greatest extent and improve the yield rate;
3	The rotation ratio of the swimming fixture is adjustable	The rotation ratio of the fixture is fixed	Diversification of process parameters can be achieved without changing the mechanical transmission ratio;
4	10 inch Mitsubishi touch screen	There is no touch screen	The picture is clearer, easy to operate, and has a long service life
5	The inner and outer ring gears are raised and lowered electrically at the same time	The inner and outer ring gears cannot be lifted or lowered individually	Extend the service life of the outer ring gear and the sun teeth, and improve the success rate of extremely thin workpieces;
6	Mitsubishi series inverters	Generic brand elements	Fast response, long service life, easy to install and maintain
7	CC-LINK communication	RS485	The motor reaction speed is more sensitive, the torque output is more gentle, and the workpiece crushing rate is low. The motor output speed is adjusted in real time to ensure an accurate rotation/rotation ratio
8	Dual cylinder pressurization	Single cylinder pressurization	The large cylinder is responsible for rapid movement, the small cylinder adopts a special low-friction cylinder, which is responsible for the accurate output of pressure, and the small cylinder compresses the gas volume and the pressure control is more precise
9	Scalable to13B/14B/15B	Not scalable	The equipment is versatile and the investment risk is small
10	NSK bearings SMC、CKD Pneumatic	Generic brand elements	High precision and long life

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Physical photos

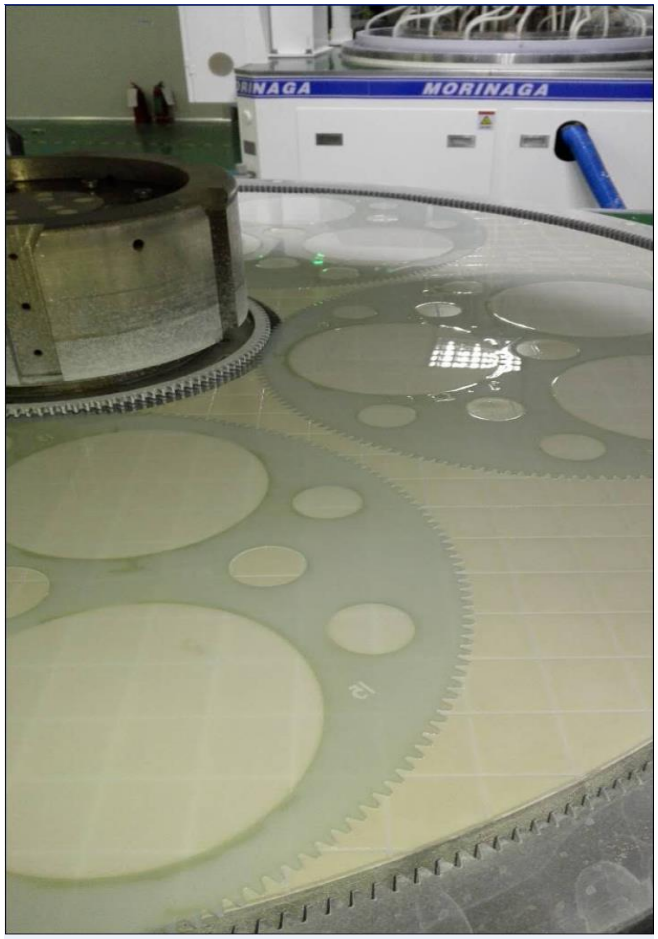


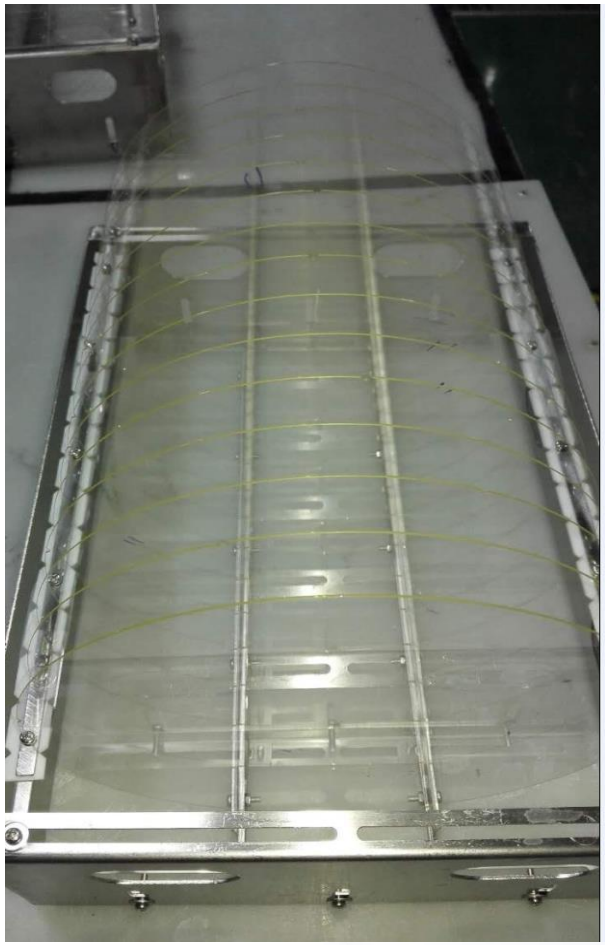






Physical photos





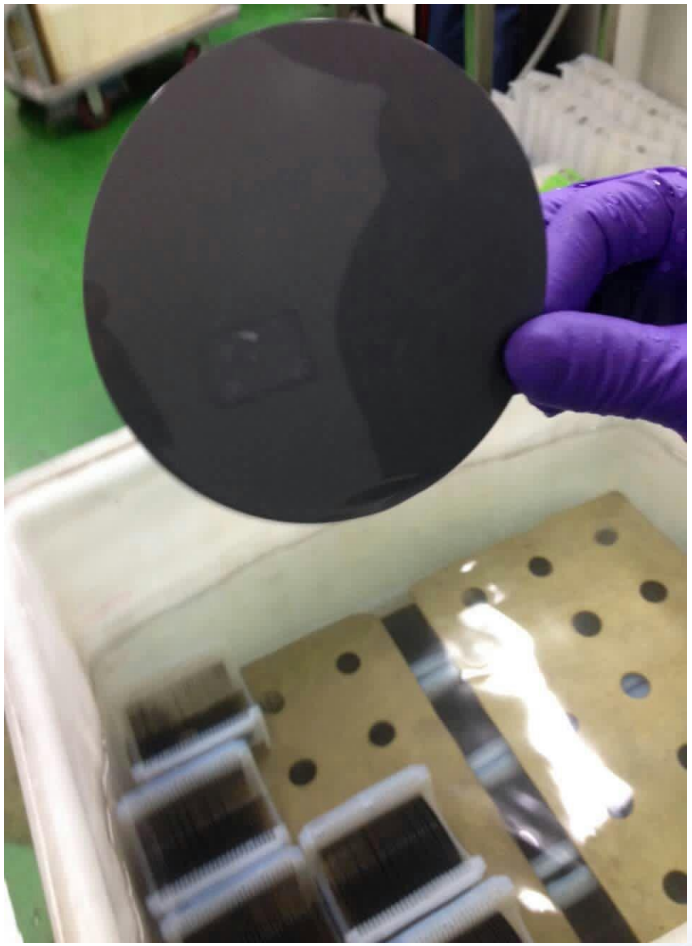
Physical photos





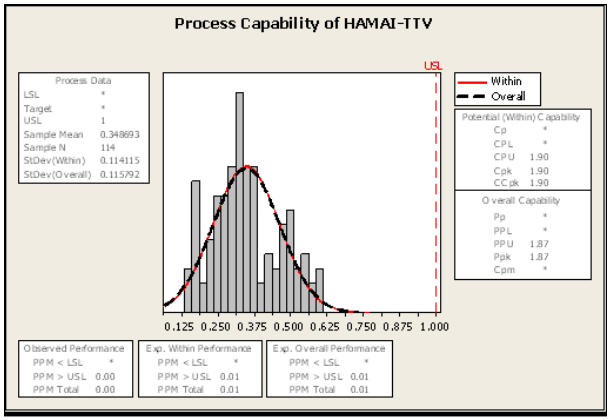
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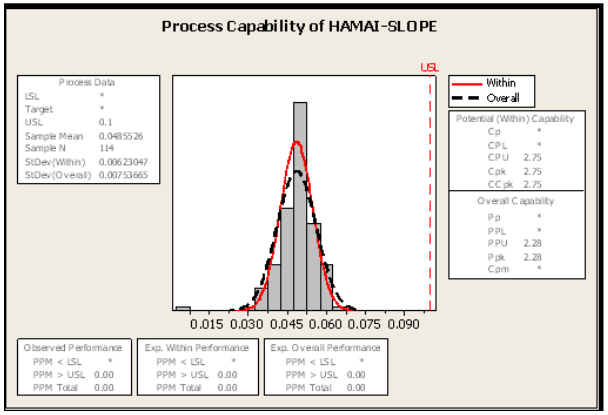




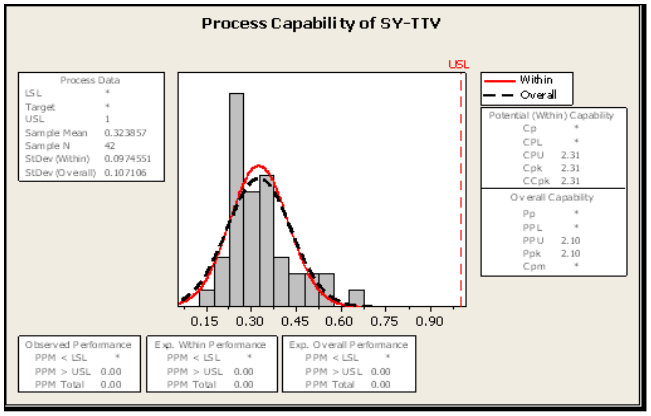
22B Verification of polishing

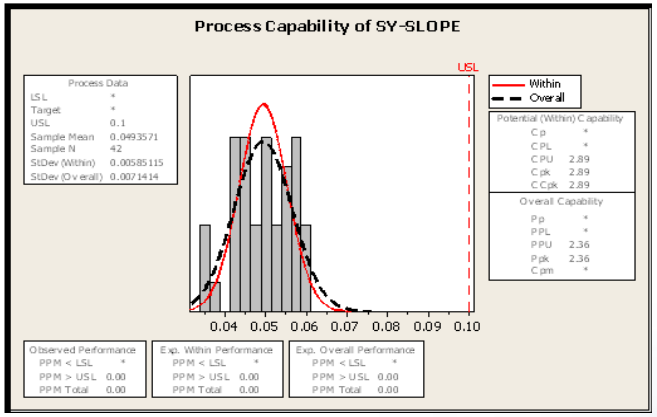
HAMAYI 22B 抛光机TTV\SLOPE正态分布图





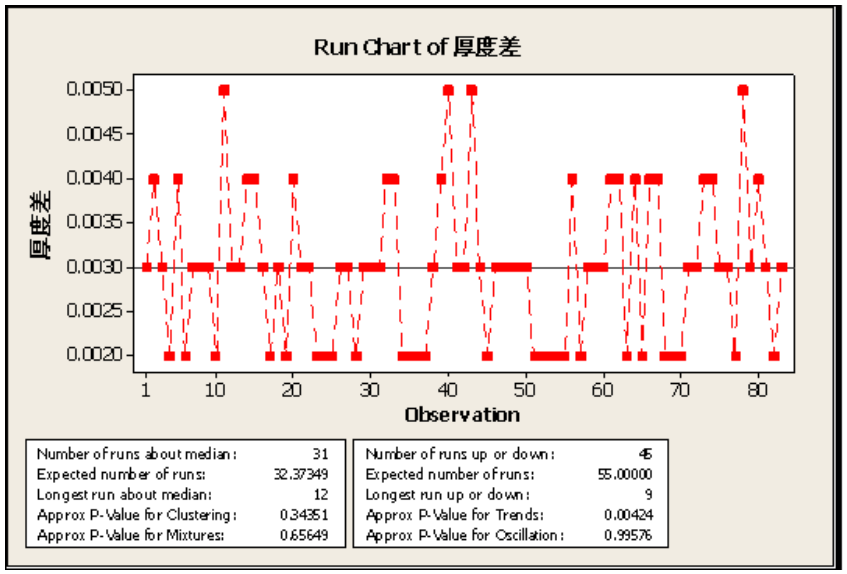
森永 22B 抛光机TTV\SLOPE正态分布图



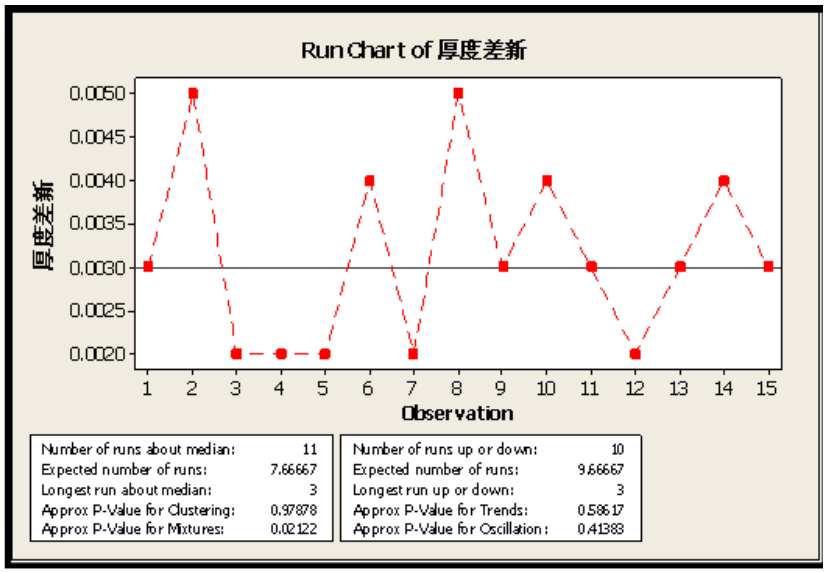


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22B Validation of the grinder



HAMAYI 机器



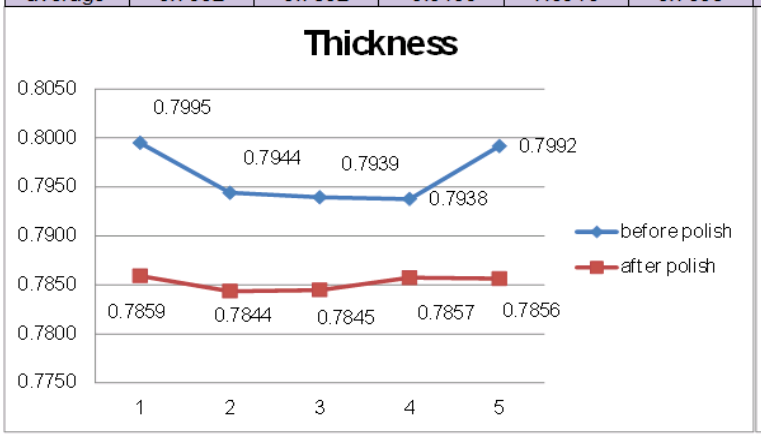
森永机器

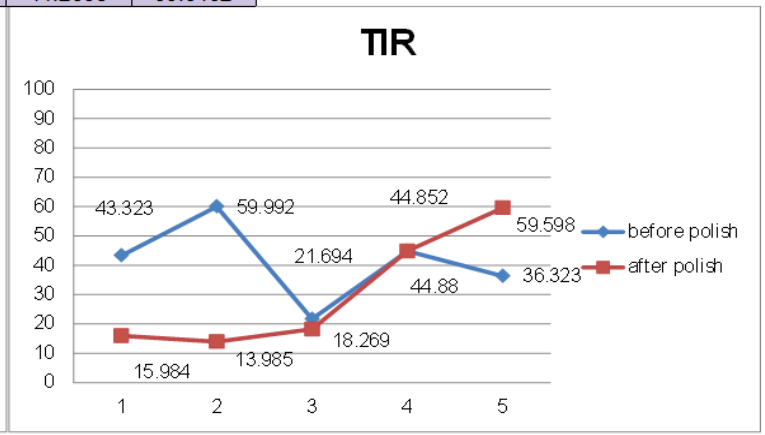
Troysupply.com

Experimental data

Thickness、TTV、Warp

打标号	Thickness			TTV		TIR	
	before polish	after polish	差异	before polish	after polish	before polish	after polish
4	0.7995	0.7859	-0.0136	9.77	**0.694**	43.323	15.984
5	0.7944	0.7844	-0.0101	5.858	**0.764**	59.992	13.985
6	0.7939	0.7845	-0.0095	6.776	**0.575**	21.694	18.269
7	0.7938	0.7857	-0.0080	7.365	**1.011**	44.852	44.88
8	0.7992	0.7856	-0.0135	8.689	**0.785**	36.323	59.598
average	0.7962	0.7852	-0.0109	7.6916	0.7658	41.2368	30.5432



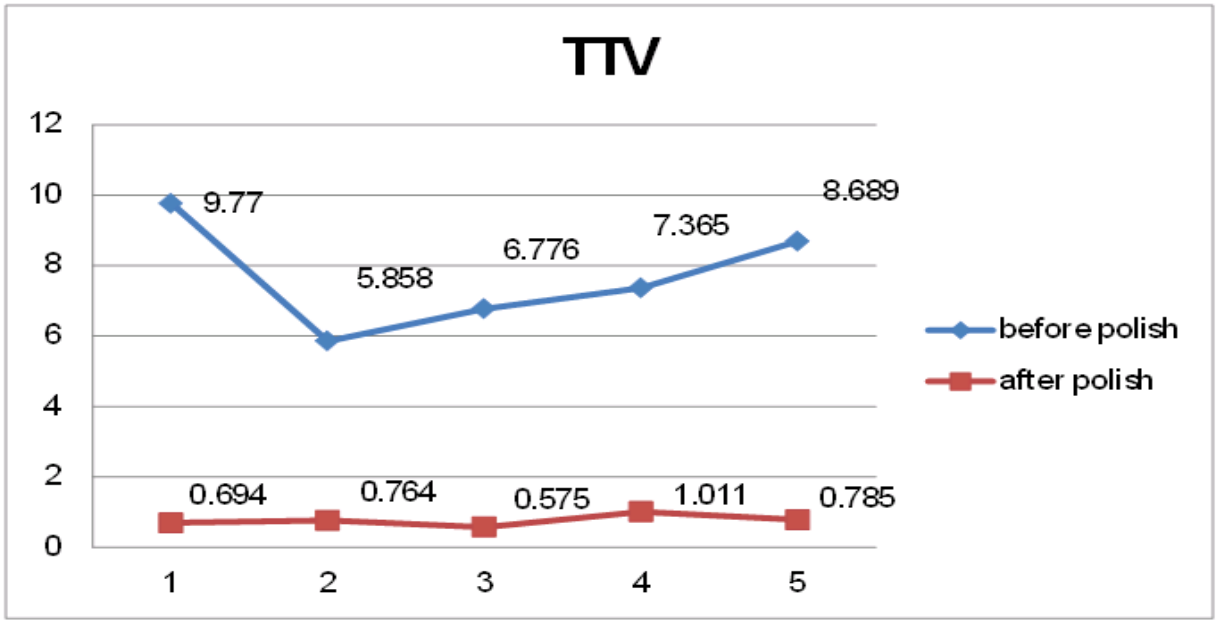


1. Thickness : φ300㎜ 0.7962 → 0.7852㎜, reduce 0.0109mm
2. TIR: range 13~60um

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Experimental data

Thickness、TTV、Warp

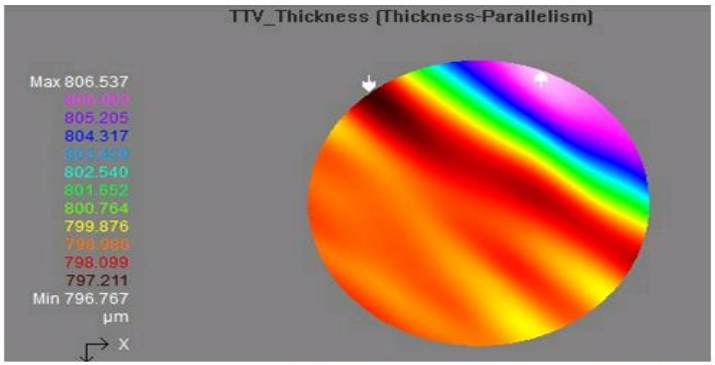


1. 经过抛光后TTV从5~10um降低到0.575~1.011
2. TTV 都能满足<0.2的要求，
3. 从MSP图中看出，TTV 的变化呈环状,中间高两侧低

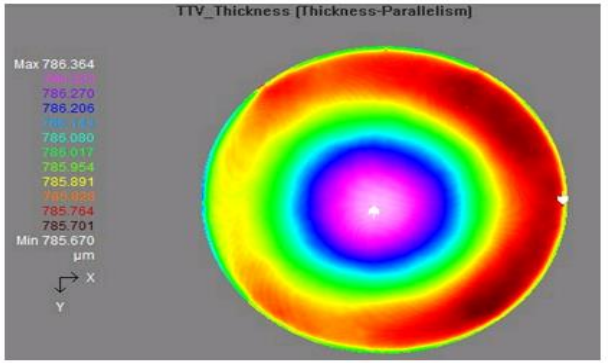
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Experimental data

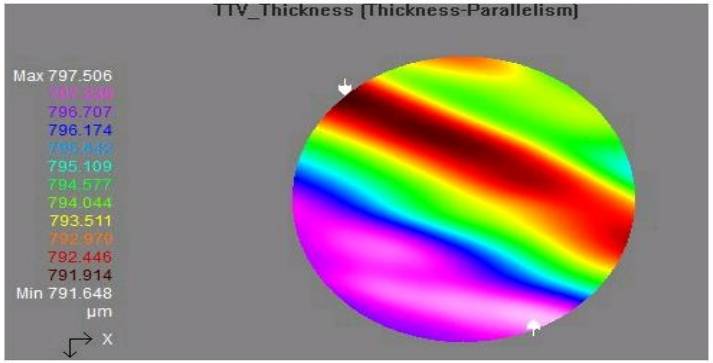
Thickness、TTV、Warp



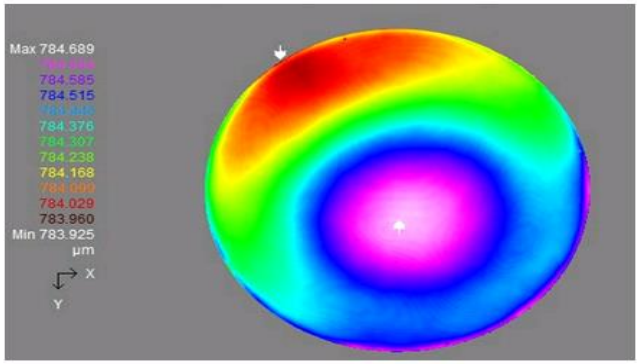
004- TTV 9.77



004- TTV 0.694



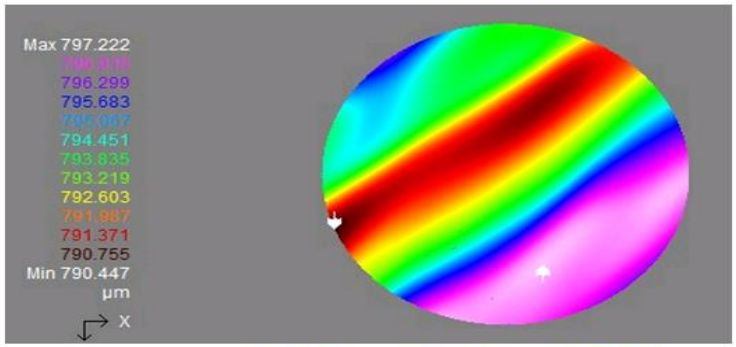
005- TTV 5.858

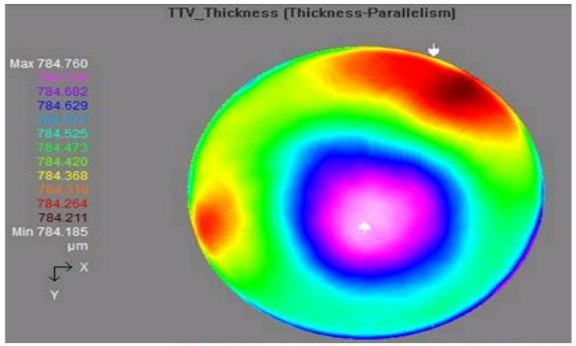


005- TTV 0.764

Experimental data

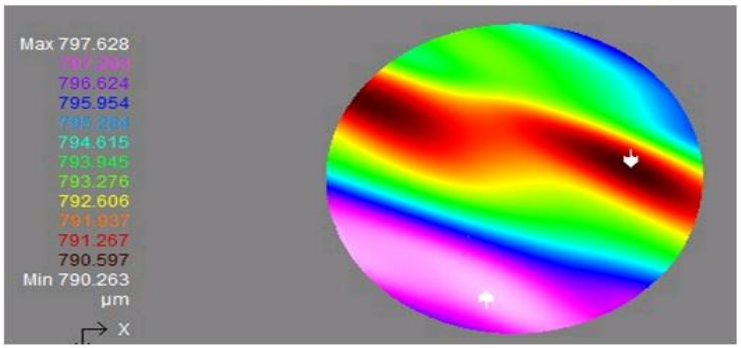
Thickness、TTV、Warp

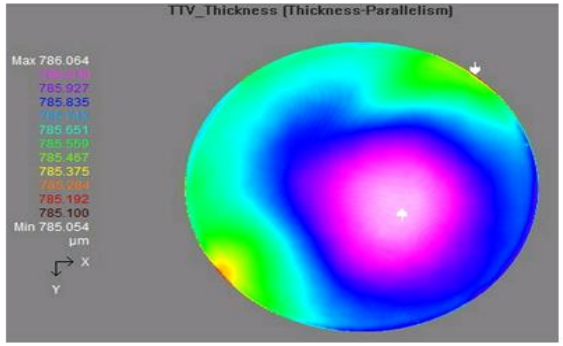




006- TTV 6.776

006- TTV 0.575



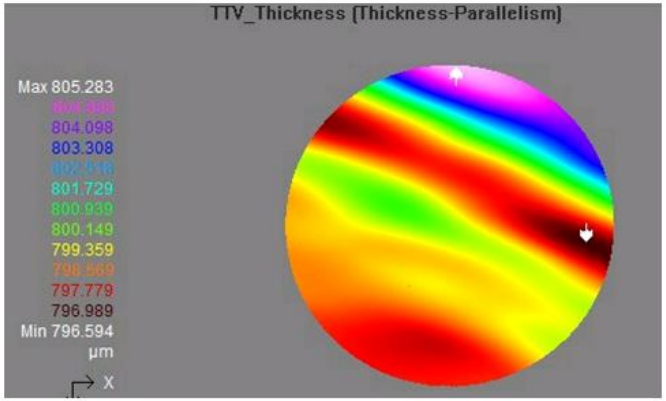


007- TTV 7.635

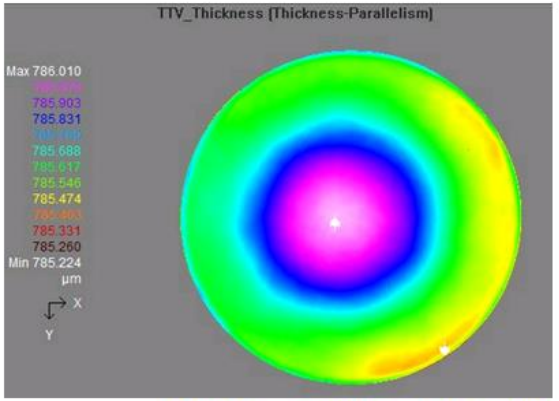
007- TTV 1.011

Experimental data

Thickness、TTV、Warp



008- TTV 8.689



006- TTV 0.785

Single-sided polishing machine ES32B/36B



Features：

- Cylinder pressurization, single shaft maximum processing pressure 250KG;
- The 4 P.P boards adopt the motor forced drive mode, which can independently control the speed and realize the P.P forward and reverse;
- Independent cooling system for the lowering plate;
- The main motor is 15KW, and the machine runs more stably;
- Multi-stage pressure control, pressure control is more accurate and stable, to ensure that the workpiece that cannot withstand high pressure can also be processed smoothly;
- Special low friction cylinder, the bore is thick to overcome the deflection of the cylinder shaft;
- PLC + man-machine interface to achieve the automation of control, 4 P.P board can be achieved by the man-machine interface to achieve ascent and descent can also be lifted by the side switch;
- Can store 20 different process programs, to achieve intelligent control of speed and pressure, easy for personnel operation and product qualification rate stability;

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32B/36B parameter

32B	36B
plate diameter Φ812.8	plate diameter Φ914
P.P diameter Φ304.8	P.P diameter Φ355
Dimensions 1484X1250X2054	Dimensions 1484X1250X2054
Weight： 2300KG	Weight： 2600KG
Power supply 380V/50Hz	Power supply 380V/50Hz
Motor power 7.5KW	Motor power 15KW
plate rotational 0~87rpm/min	plate rotational 0~87rpm/min
Air pressure 4Mpa	Air pressure 4Mpa

36B Number of wafers processed

4 axes are machined simultaneously

Machine Model (Wafer Size)		2"	4"	6"
36GPAW (TD)	Block/Batch	4	4	4
	Wafer/Block	25 (內外圈)	7	3
	Wafer/Batch	100	28	12

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36B Polishing machines for semiconductor materials



50B Single-sided polishing machine



50B Device specifications

1) Body specifications

Equipment size : 1,720mm×2380mm×2,633mm(W×D×H)

Lower plate material : ＳＵＳ316

Lower plate diameter : Φ１,２８２mm（Φ1,282 X Φ310）

PP Material : ＳＵＳ３16

PPdiameter: Φ485mm（wafer４“Number of sheets with: MAX: 10枚/1Block/1PP）

PProtate speed : 5～90min-1 (Frequency converter drive)

PPMaximum pressure: 350KG

weight : ６，１００Kg

2) Electrical specifications

Main power supply : ３８０Ｖ ５０Hz ３Φ

Control voltage: １００Ｖ ６０Hz 及ＤＣ２４Ｖ

Motor for the Lower plate : 22Kw 4P

PP Motor for forced drive : ０．４ Kw ×４个＝１．６Kw

Mitsubishi Q02CPU + Mitsubishi A series inverter + Mitsubishi 10 inch touch screen

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50B Device specifications

3) Barometric pressure specifications

Apply air pressure : ＞0．6 MPa

A full set of SMC+CKD pneumatic elements

4) Cooling water specifications

Position : Lower plate

amount : 25L/min (MAX)

4 axes simultaneous machining max quantity

Artifact size		2 inch	4 inch	6 inch	8 inch	12 inch
50B	P.P quantity	4	4	4	4	4
	Single P.P quantity		14	6	3	1
	All quantities		56	24	12	4

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Automatic water cooling system for the lowering plate

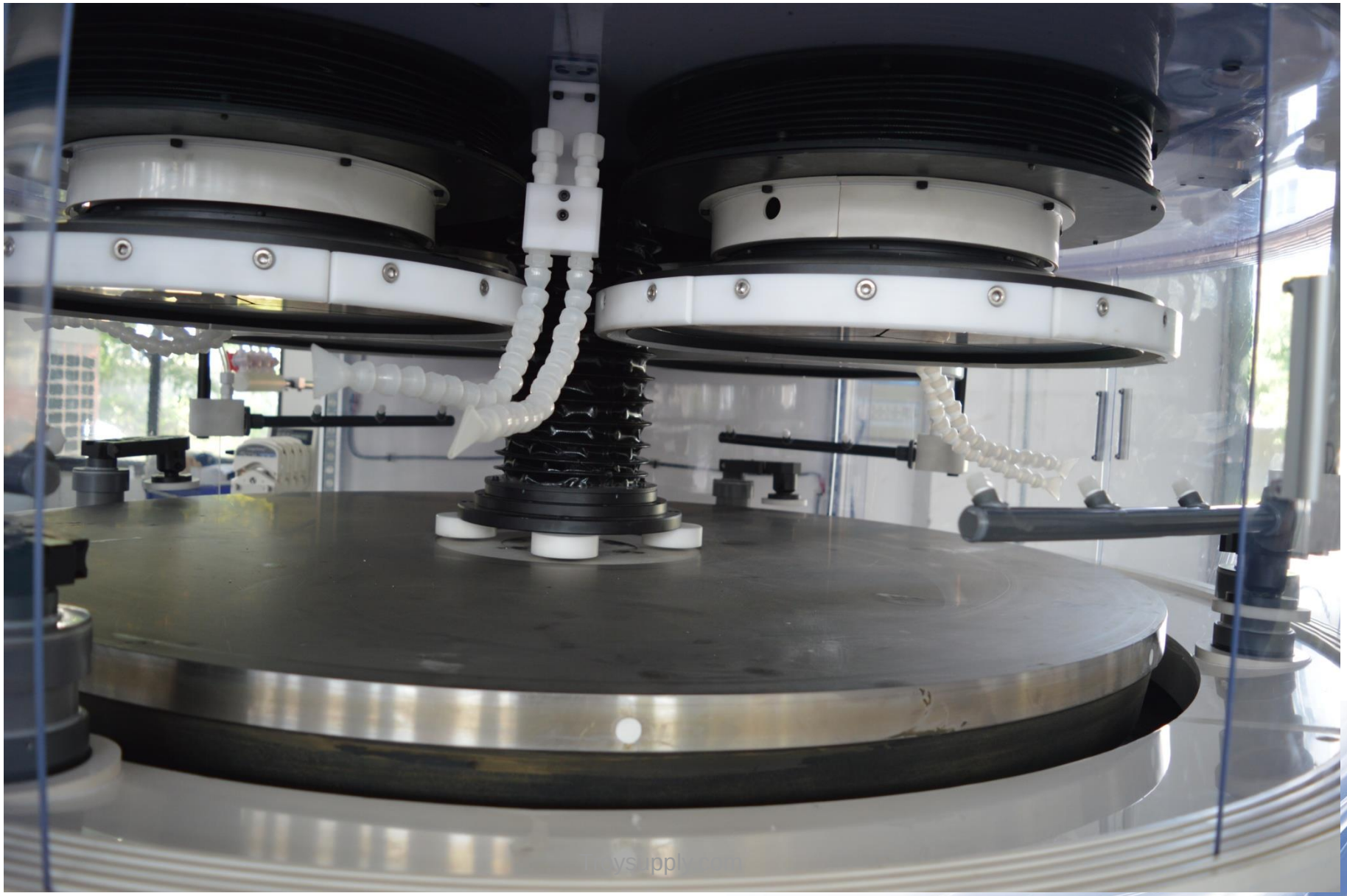
Due to the fast speed and high pressure during the polishing process, the friction between the workpiece and the polishing skin is also large, so a large amount of heat is generated in the process of polishing. If the temperature exceeds the controllable range, it will affect the chemical reaction speed of the polishing, thereby reducing the polishing rate and even affecting the polishing quality of the workpiece. Although the use of polishing fluid circulation can play a certain cooling effect, the effect is not very obvious. Therefore, the lower plate of the equipment needs to be cooled. The water circulation joint is used to cleverly pass the cold water in the external chiller into the lower set plate, and the heat is taken away after circulation. With infrared temperature control sensor real-time detection of the temperature of the lower plate , when the actual temperature exceeds the set temperature, the solenoid valve in the system will automatically open into the cold water, after reaching the set temperature, the solenoid valve closes, to achieve closed-loop control of temperature.

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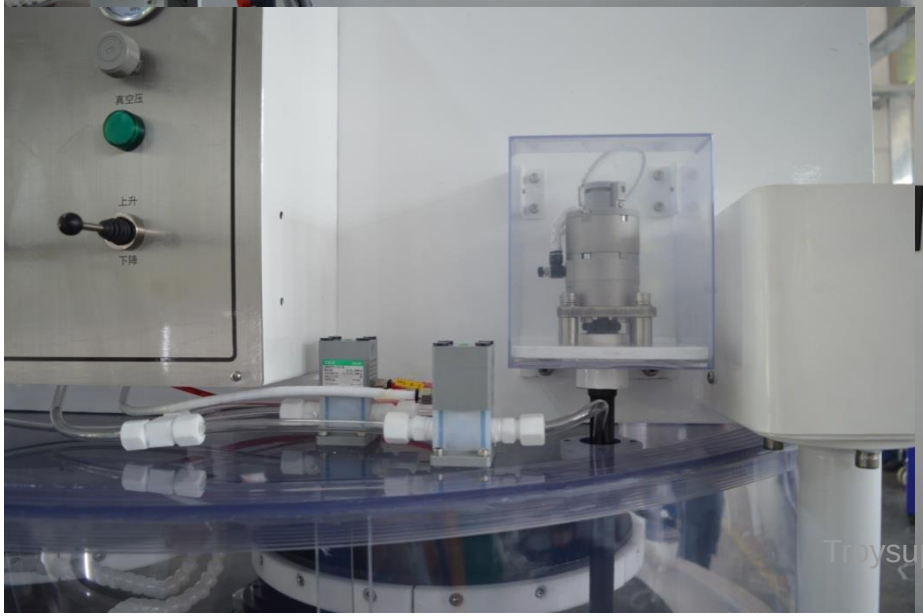


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Polished 4 inch gallium arsenide wafer



Polished 12 inch silicon electrode