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Introduction of BEST CEO Equipment From Japan

JAPAN

SAITAMA CITY
LEADING-EDGE
さいたま市テクニカルブランド企業

LOCATION

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SAITAMA Prefecture
(Approx. 30 km from Tokyo)

PRODUCTS

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Coater

Mask Aligner

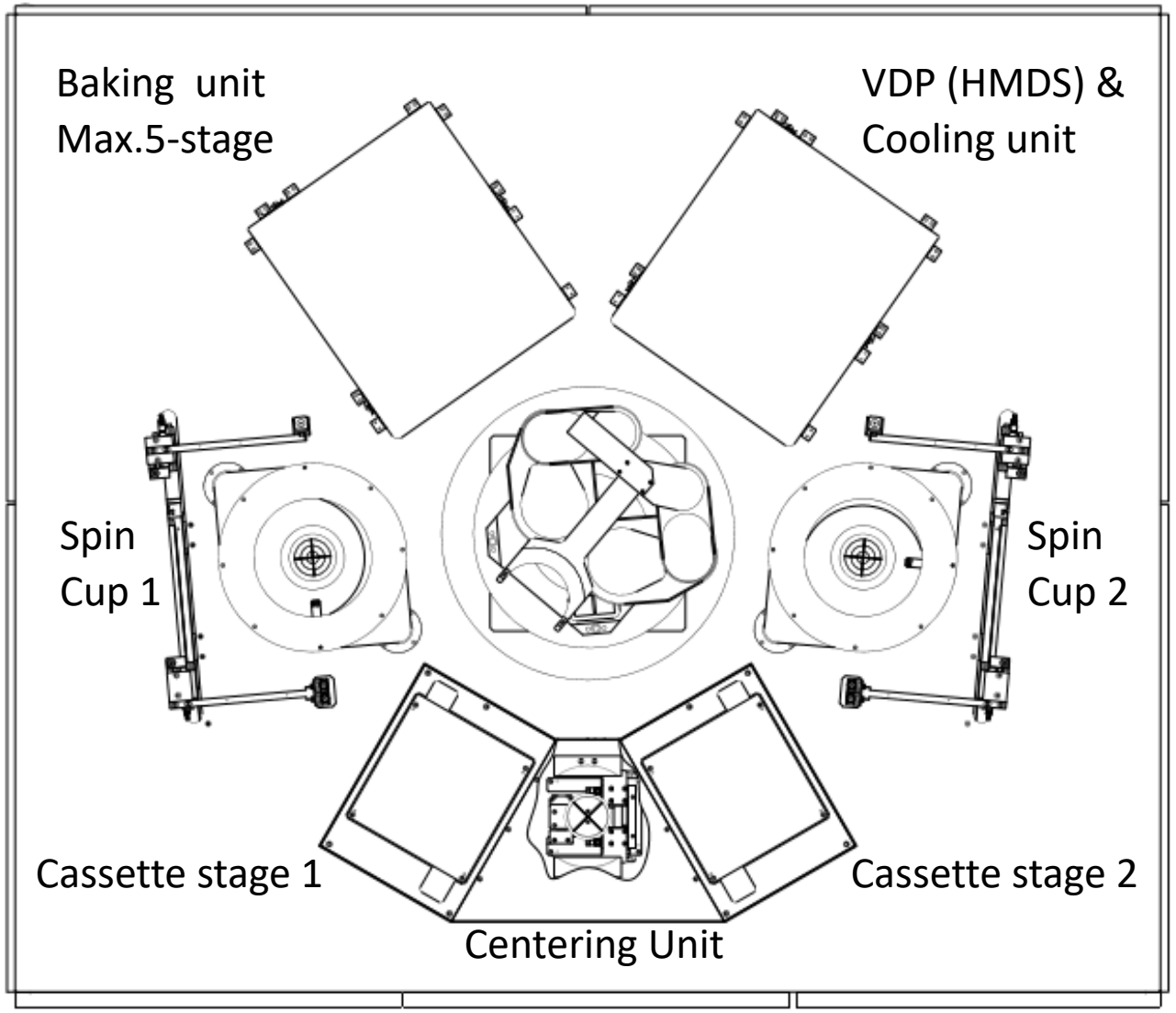
Developer

Lift-Off

Only Company in Japan with this Product Suite Offering

SALES RECORDS (as of Sept. 2018)

Typical System Configuration



Spin Cup Design and Purpose

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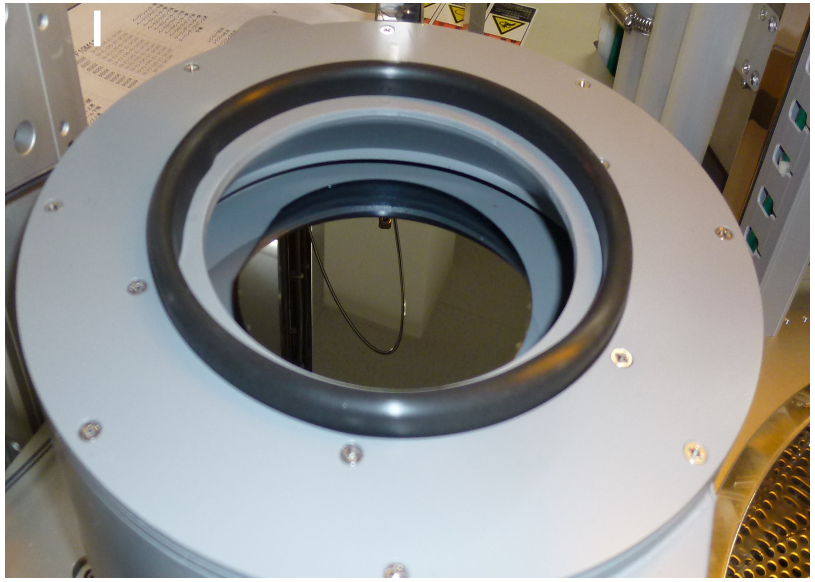
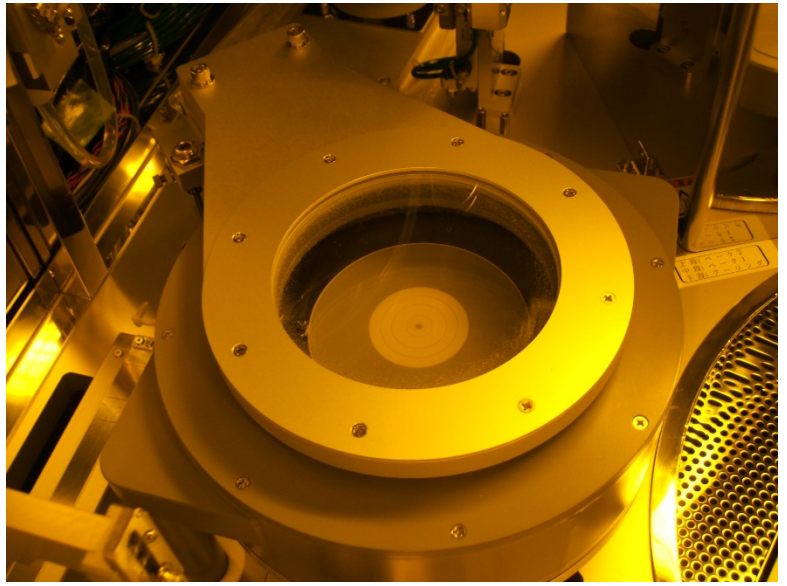
Cup design differs from depending on viscosity, substrate shape and target thickness.

OPEN



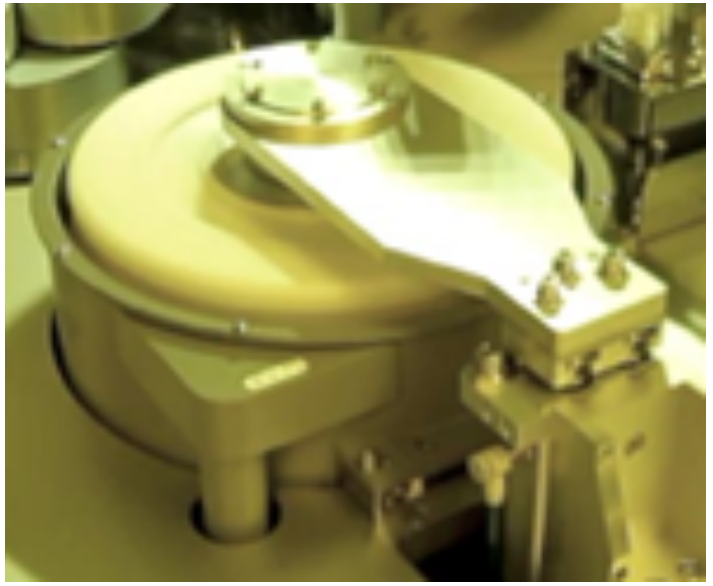
For thin film coating or
Low Viscosity Photoresist,
mainly for **Positive PR**

CLOSE



For thick film coating or
High Viscosity Photoresist,
Mainly for **Negative PR**

CUP ROTATION



For **Square substrate** or
Expecting good coverage,
Less material coating (eg) PI

User: National Institute *(AIST)* at TSUKUBA in JAPAN

Advanced Industrial Science and Technology

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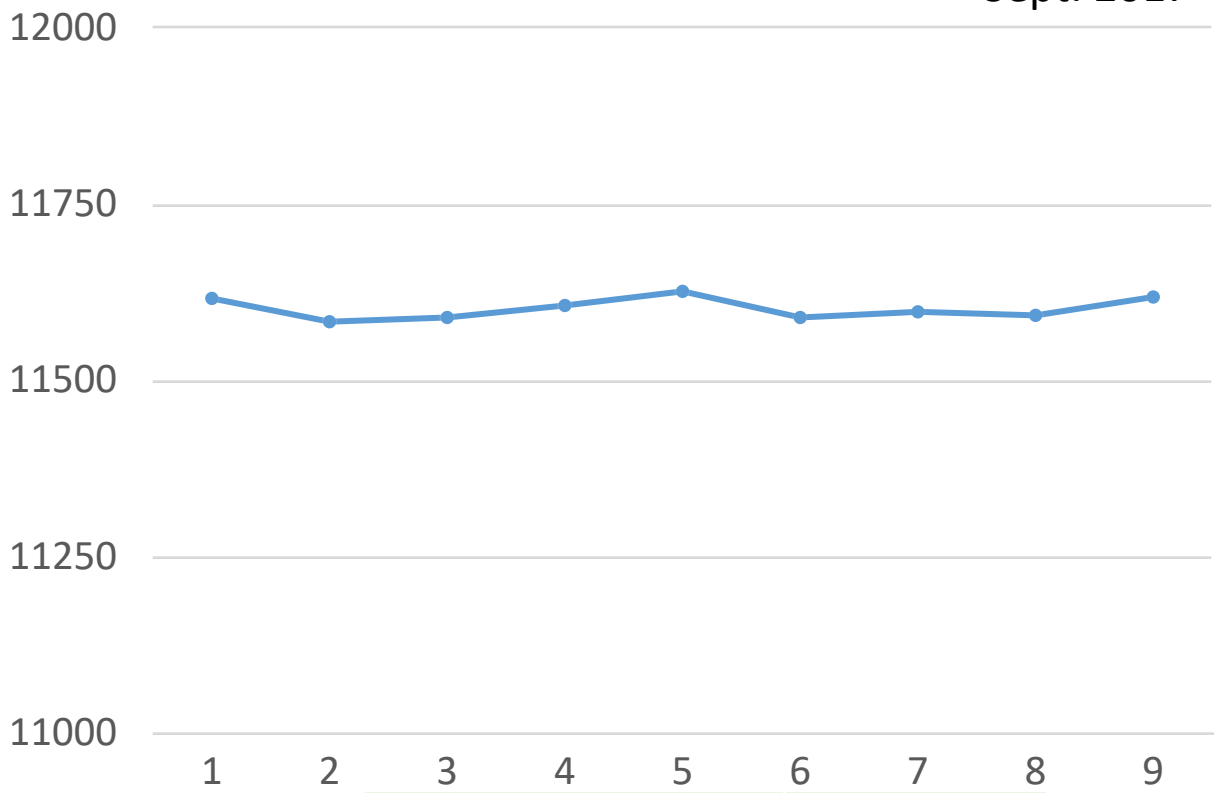
Sept. 2017

No.	X [mm]	Y [mm]	Thickness[Å]
1	0	0	11617
2	-20	0	11584
3	20	0	11590
4	0	-20	11607
5	0	20	11627
6	-40	0	11590
7	40	0	11598
8	0	-40	11593
9	0	40	11619



Work size: ϕ150mm **Si**

Target thickness: 11000 **Å**

Photoresist: **OFPR-800LB (23cp)**

Coating cup: OPEN type

Baking Temp. 100 °C (Prox.)

Baking Time 90 sec.

Average [Å]	11603
Deviation	14.4
Uniformity [%]	0.4

Reference user: Crystal devise maker

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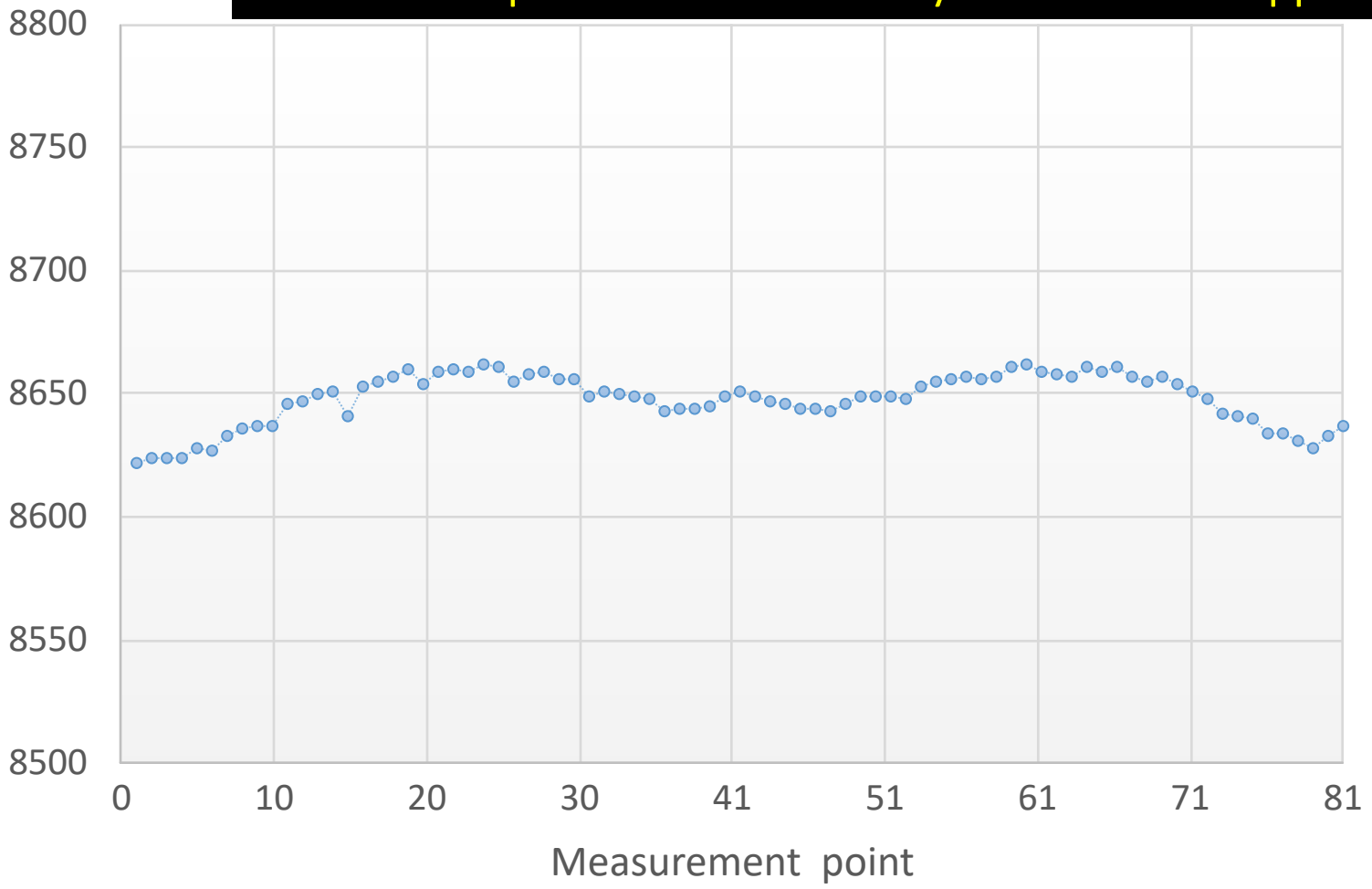
Constant temperature and humidity control unit is applied



Work size: ϕ150mm **LT**
Photoresist: i-line resist
PFI-38AL (9cp)

Baking Temp. 100 ℃ (Prox.)
Baking Time 60 sec.
Measurement point: 81

Target Thickness	8600
Max	8662
Min	8622
Average	8648
Range	40
Uniformity (±%)	0.23

TSMR-8900 Coating Data (W-to-W)

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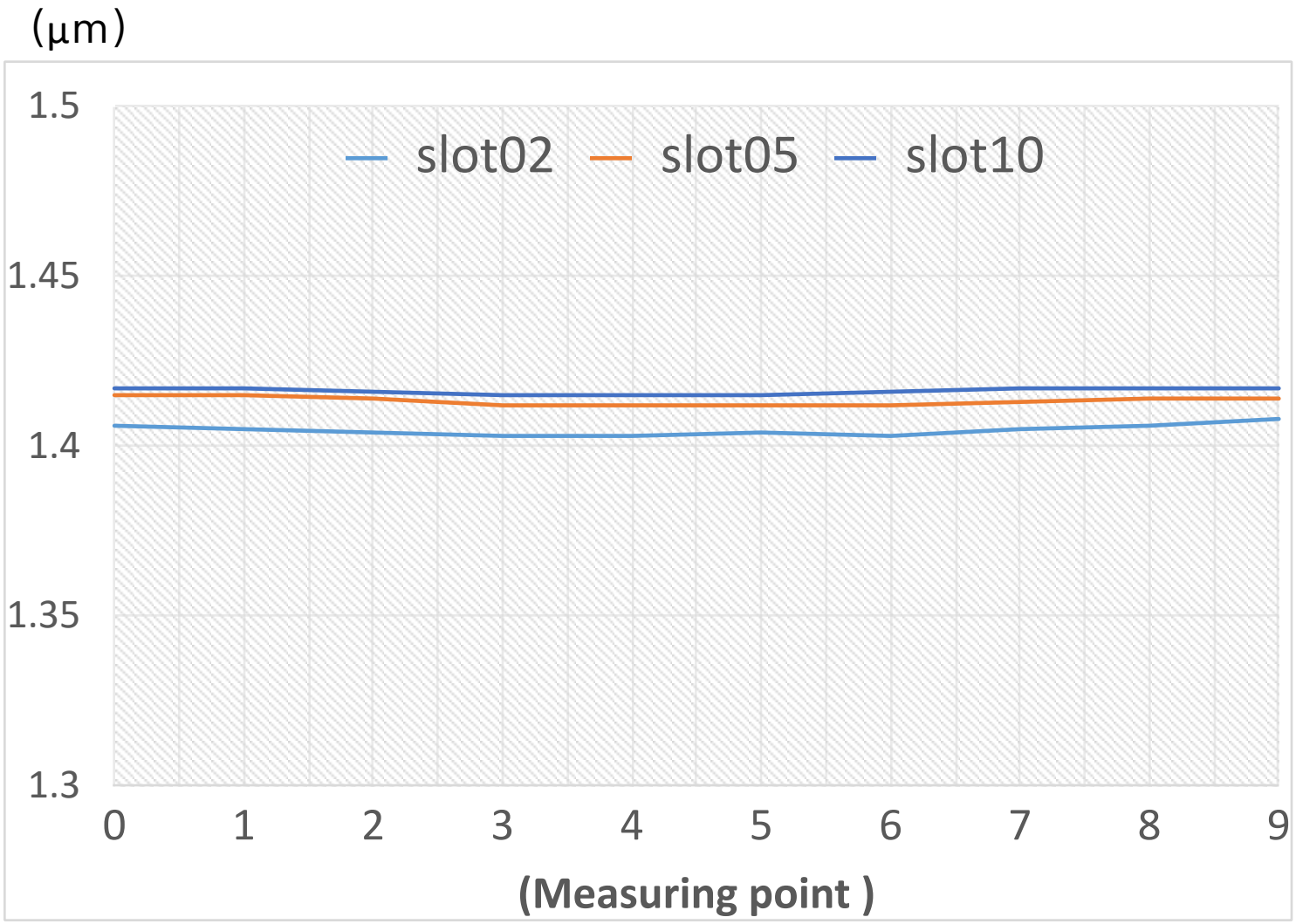

Work size: ϕ200mm **Si**
Target thickness: 14000 **Å**

	slot02	slot04	slot10	W-to-W
MAX	1.408	1.415	1.417	
MIN	1.403	1.412	1.415	
AVERAGE	1.405	1.413	1.416	
Uniformity ±%	**0.5%**	**0.3%**	**0.2%**	**0.45%**

Spin Coat
for
“Square or Rectangular” substrate

CUP ROTATION DESIGN

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Conventional Spin Cup Design

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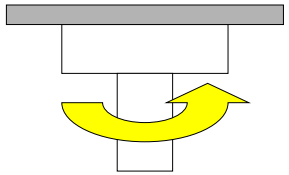
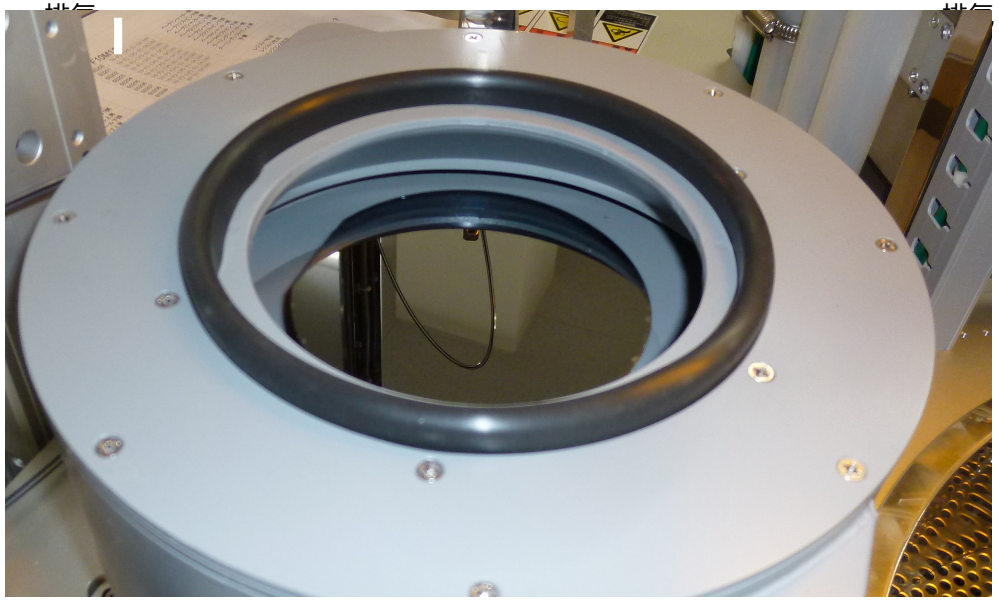
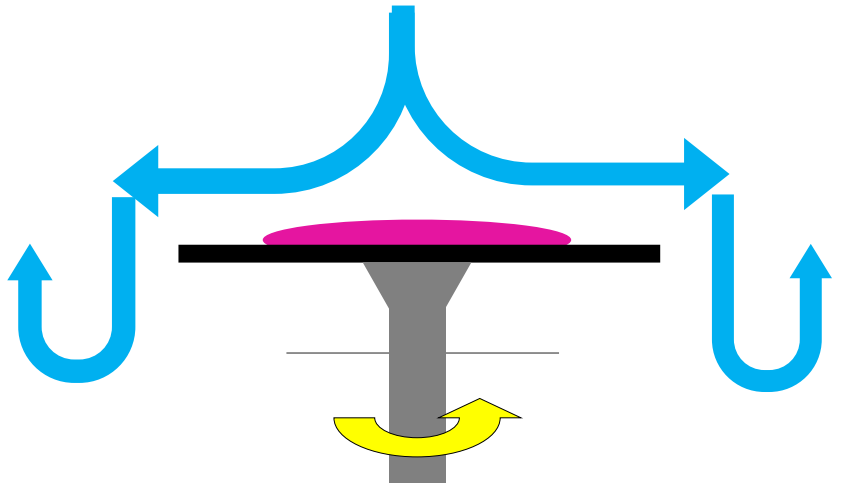
OPEN







Exhaust

Exhaust

More than 90 % of material will be thrown away in vain in order to achieve the target thickness.
Material usage is below 5%.

Concept of Cup Rotation Coating

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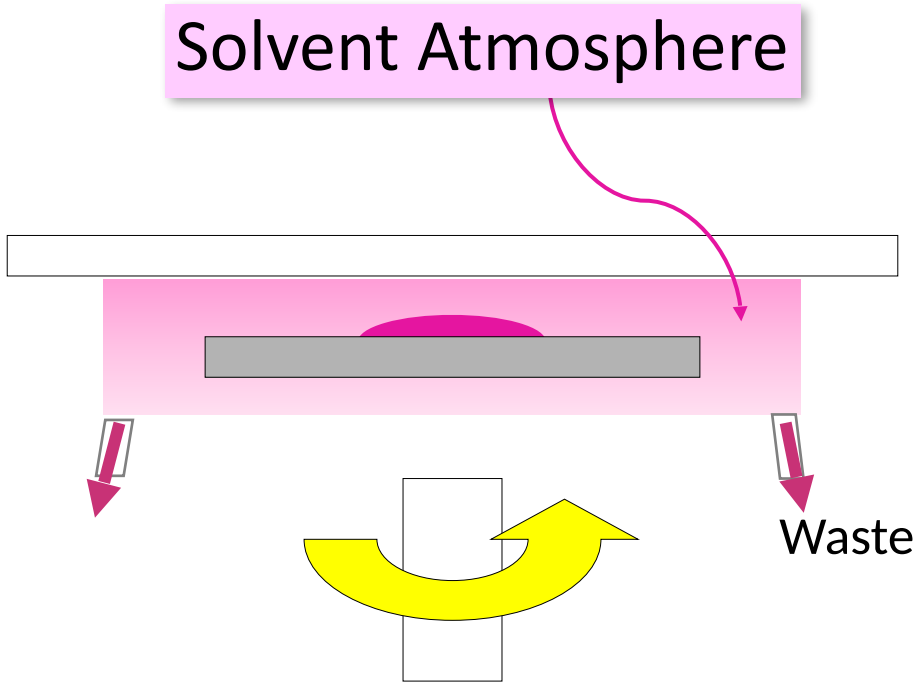
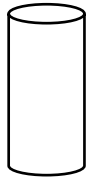


Exhaust



Drain / Waste

Exhaust

Only centrifugal force is generated in the cup and no airflow is generated.

ASAP unique Cup Design

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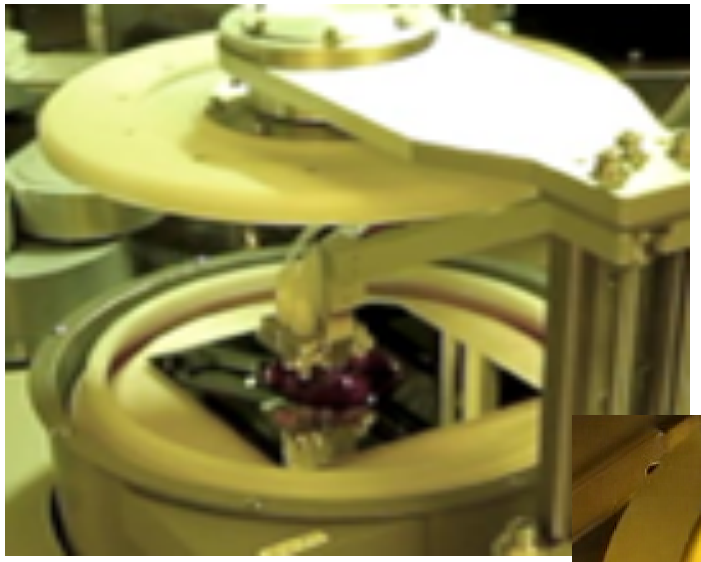

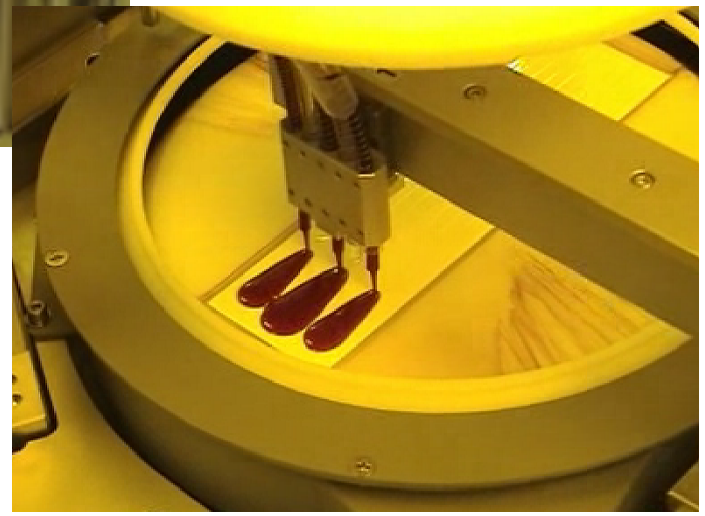

Japan Patent No.
3821468 (in 2001)

Originally this is designed for Mas

- **Square Substrate**
- **High viscosity resist**
  - ***Thick film coating***
  - ***Uneven surface***
- **Less material usage**

Square Substrate coat

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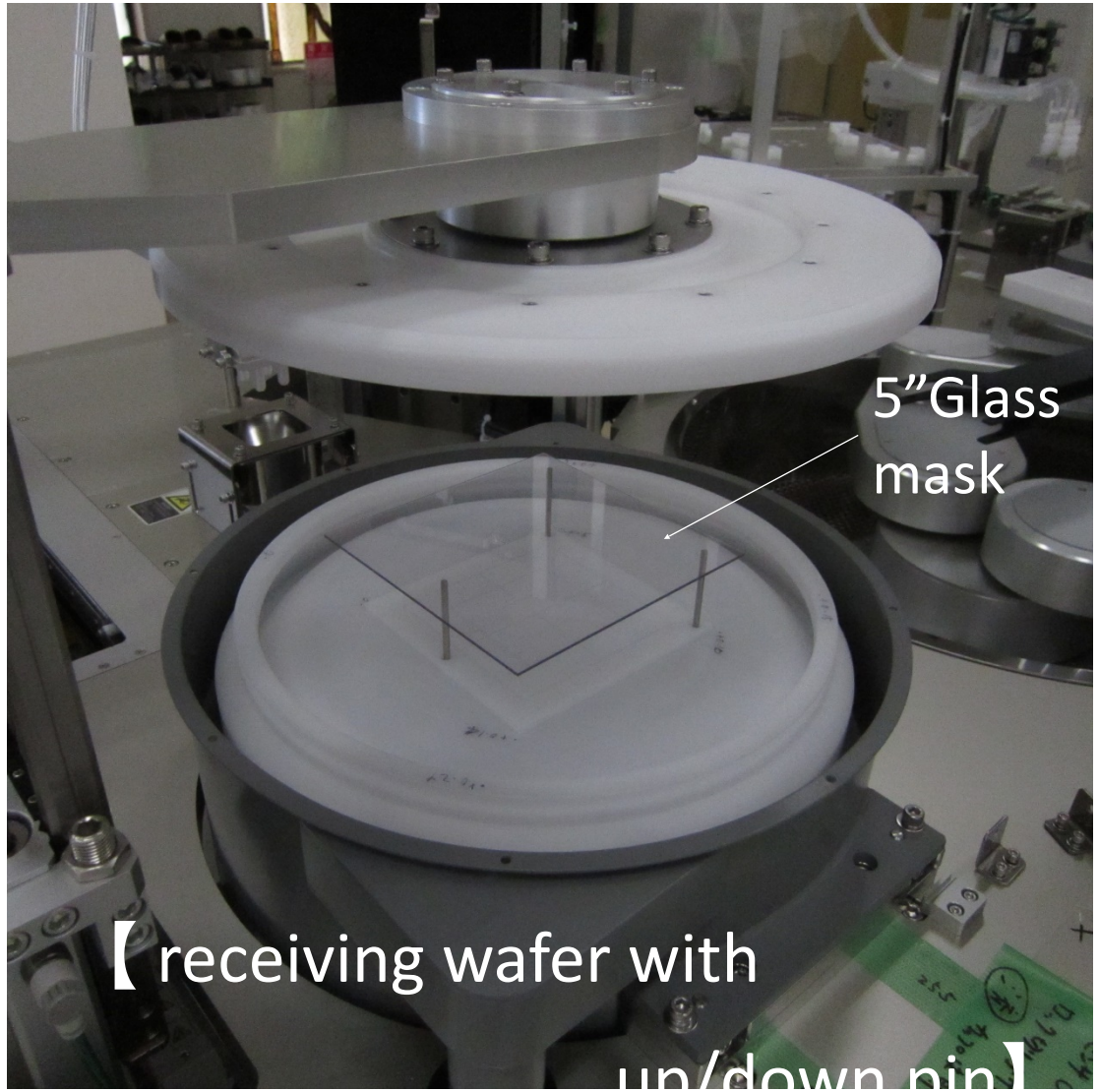

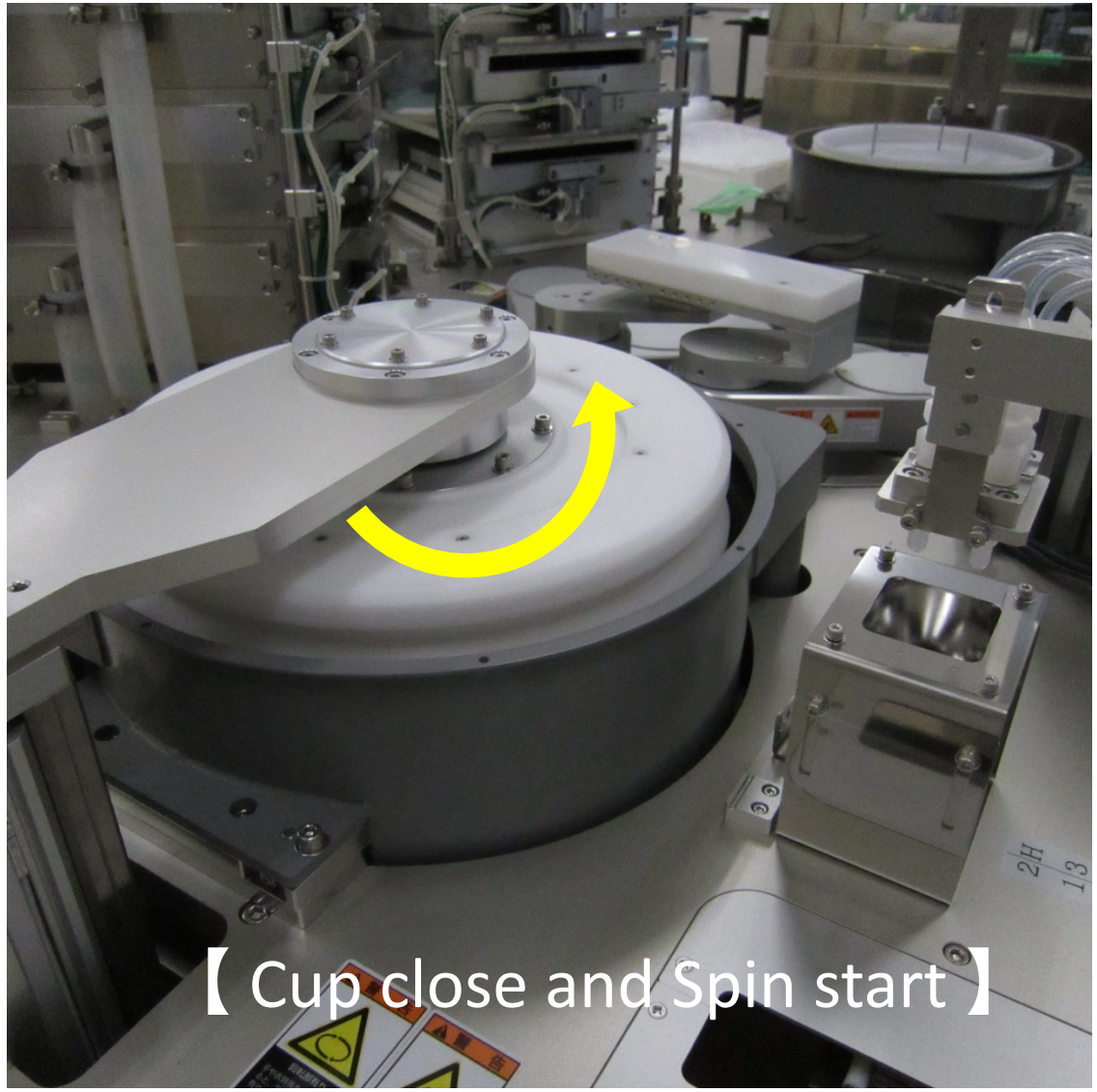

Comparison of Coating Result

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Conventional spin cup

The substrate Corner dries firster.

VS

Cup rotation type

No airflow is generated and only centrifugal force is generated inside the cup

A fringe-free coating is realized.

Comparison of Coating Result

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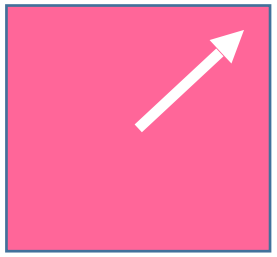
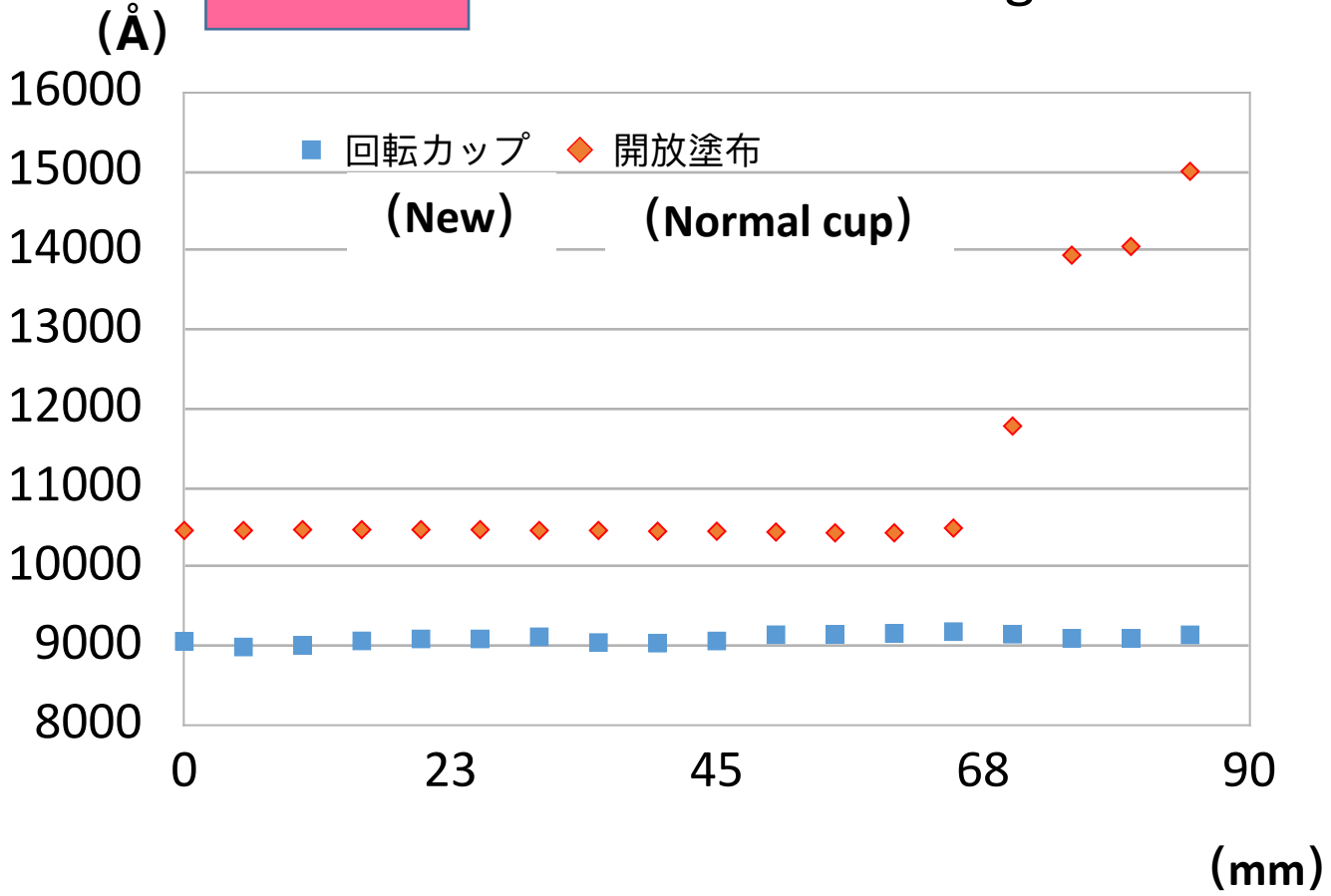
Sub. Size: 5 inch sq. (Glass)
Target thickness: 1 micron



Measuring : 18 points
Every 5 mm distance
From center to edge 3 mm inside.

	New cup	Open cup
Max.	9201	15000
Min.	8987	10430
Ave.	9109	10980
Range	214	4567
Uniformity (%)	2.3	41.6
RPM	1200	3600



Thick Film Spin Coating

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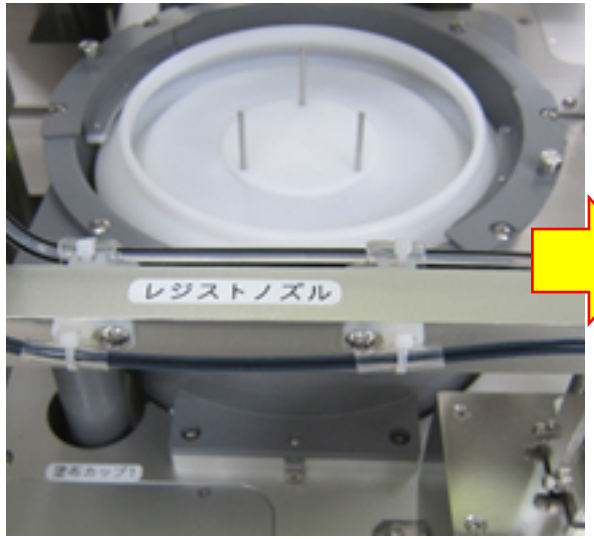
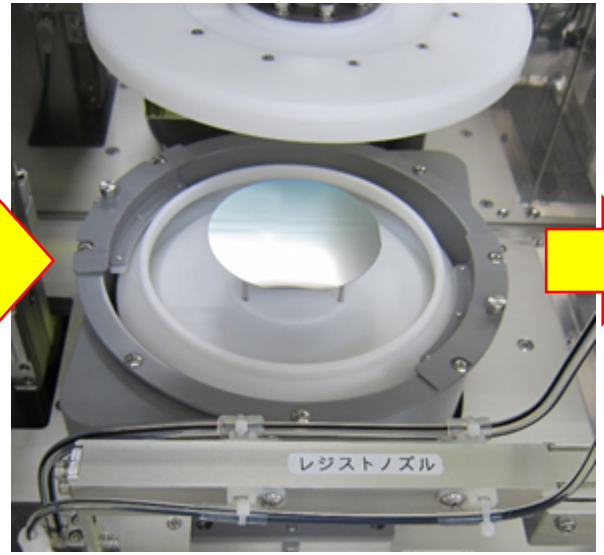
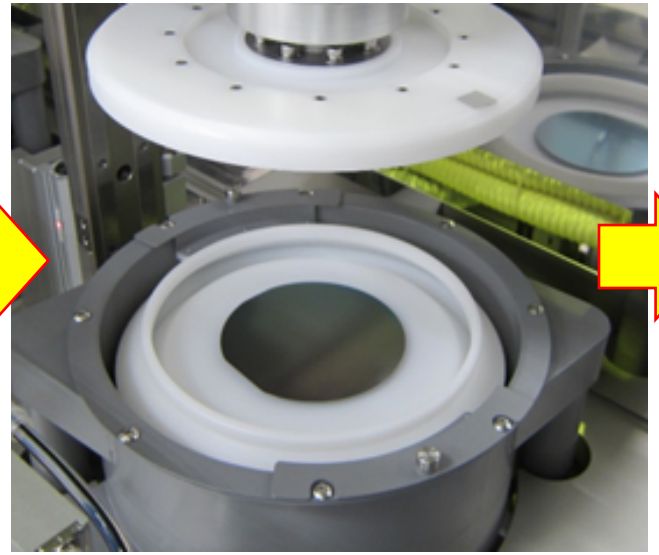


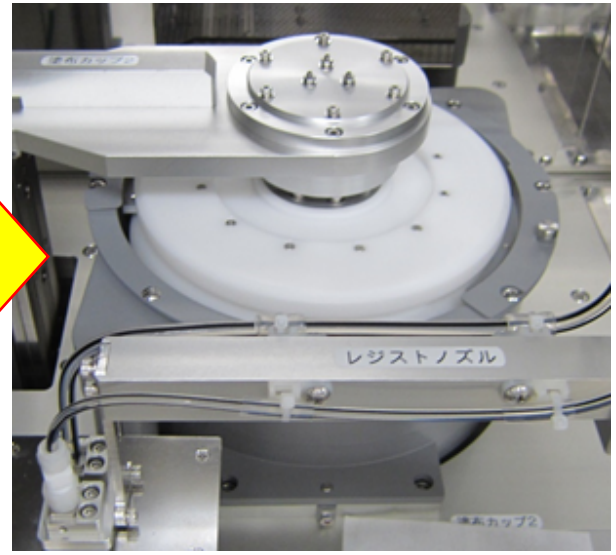
Ready



Place work



Work hold by vacuum
& PR dispense



Close & Spin

Φ200mm wafer coating data

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Resist	Tokyo Ohka TCIR 96cp
Wafer size	8 inch
Measure point	25point except outside 3mm
Max	40300 Å
Min	39746 Å
Average	39905 Å
Range (Max-Min)	554 Å
Uniformity (Range/Ave)	**1.39%**
Uniformity (WtoW 25pc)	**0.84%**

Resist	AZ electronics AZ4620 400cp
Wafer size	8 inch
Measure point	25point except outside 3mm
Max	63013 Å
Min	61966 Å
Average	62529 Å
Range (Max-Min)	1047 Å
Uniformity (Range/Ave)	**1.67%**
Uniformity (WtoW 25pc)	**0.91%**

Resist	JSR THB 1750cp
Wafer size	8 inch
Measure point	25point except outside 5mm
Max	420439 Å
Min	404868 Å
Average	413716 Å
Range (Max-Min)	15571 Å
Uniformity (Range/Ave)	**3.76%**
Uniformity (WtoW 25pc)	**1.13%**

Polyimide coating performance

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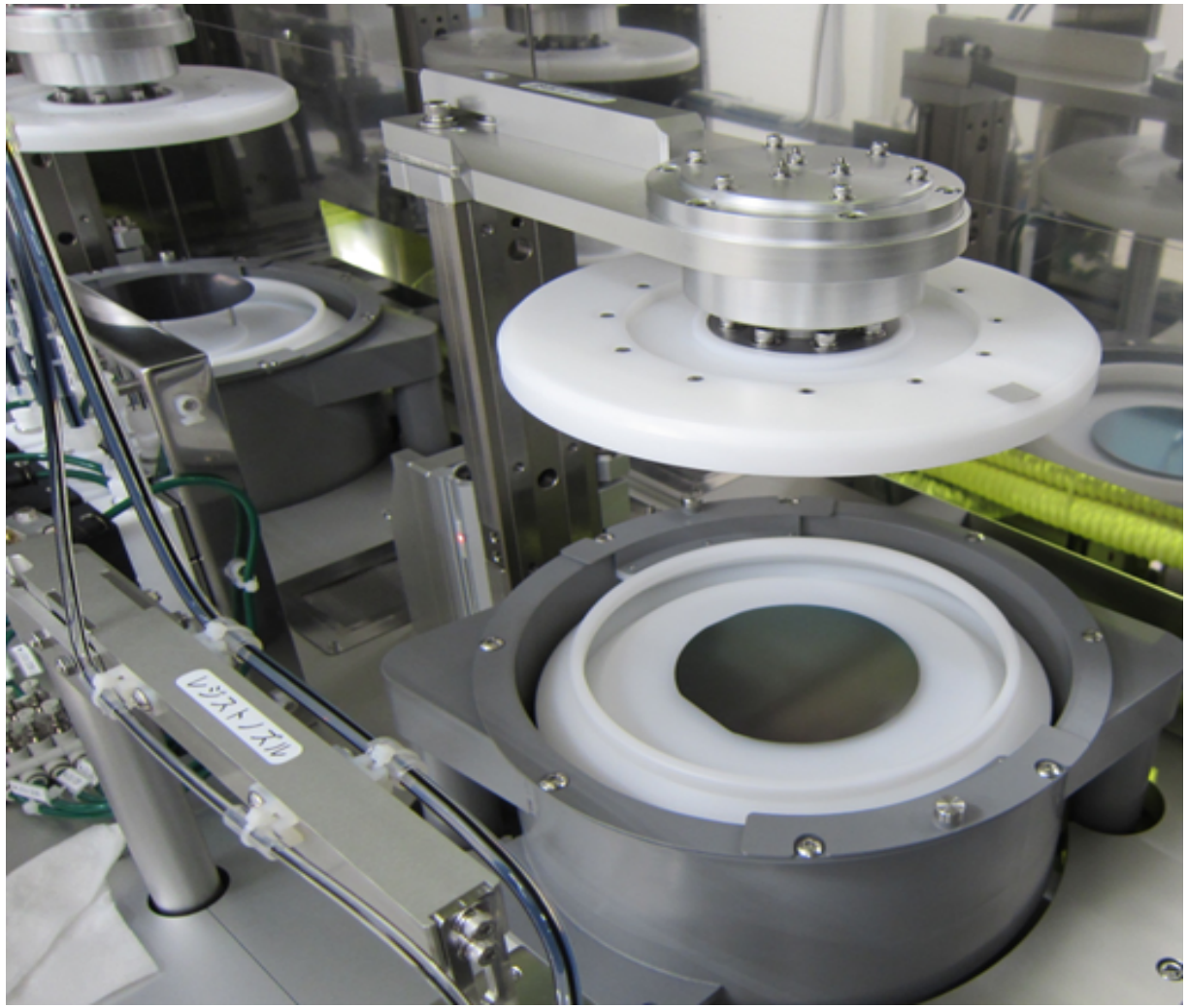
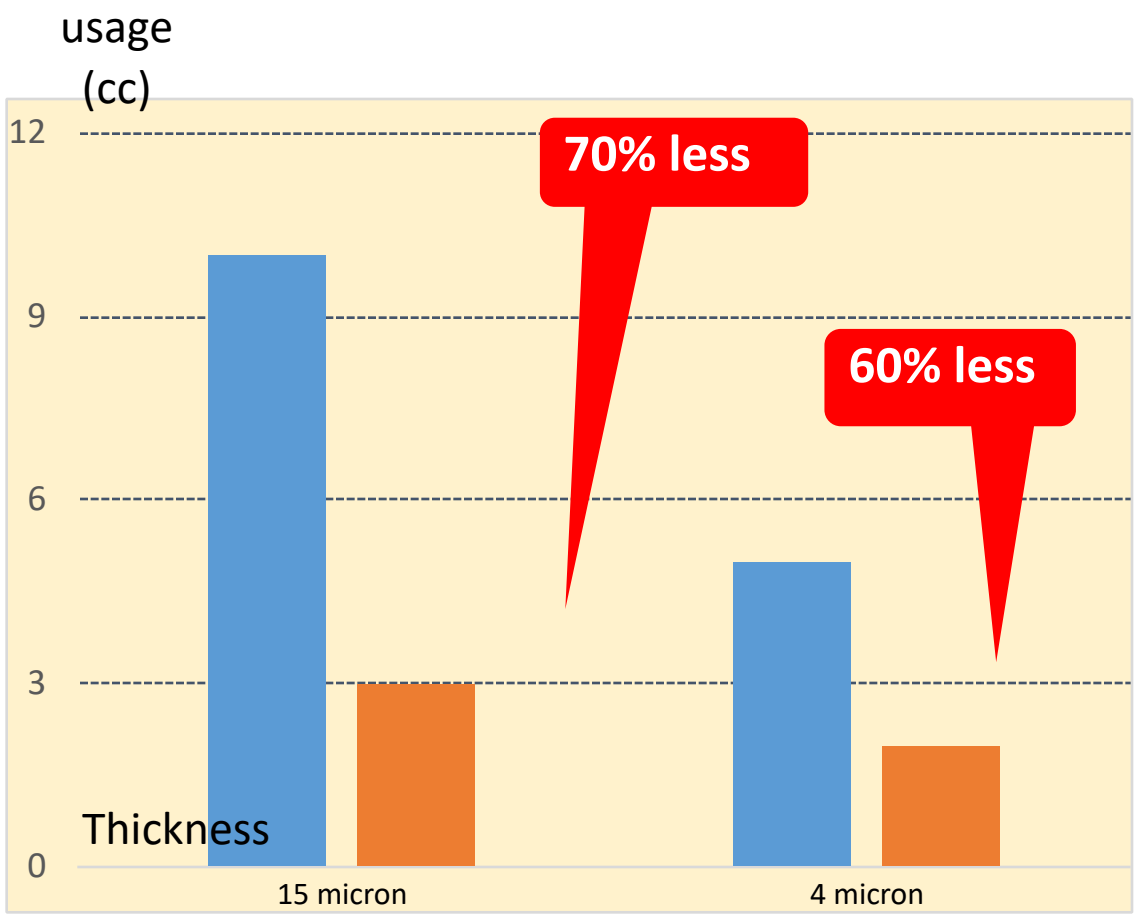
(e.g.) **Polyimide** coating for **Φ150mm** wafer





Double Side Coater
with
Wafer Flip Mechanism

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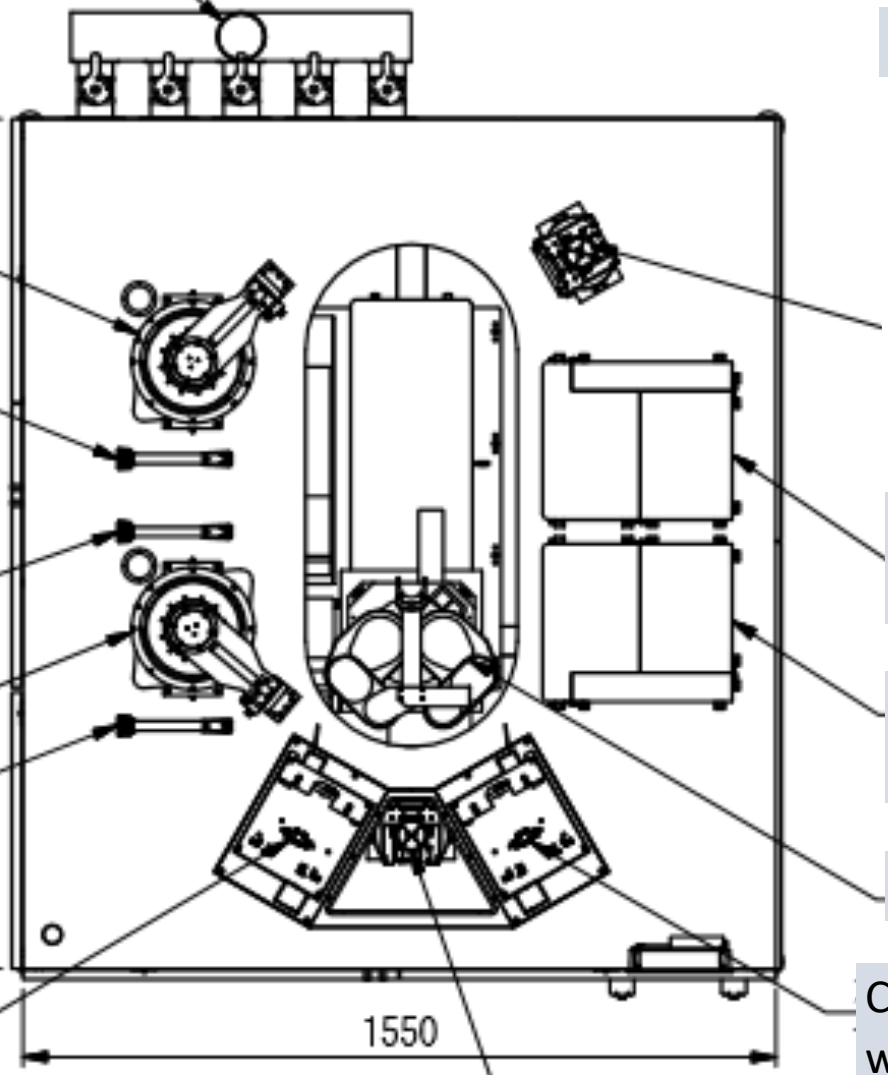
Double Side Coater System Configuration

(for ϕ150mm wafer)



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Thank you very much for your attention.