
POLI- 500, POLI-762 Quick Overview

G&P Technology

Overview of POLI-500 for 4 ~ 8" Application



4"-8" Wafer CMP Equipment

- **Head, Table** : 30 ~ 200 rpm, Rotational motion
- **Head oscillation** : ± 20 mm
- **Size** : 1100W 1150D 1880H mm
- **Platen size** : $\Phi 508$ mm (20 inch)
- **Pressing method** : Variable air pressure electronic controller
 - 1) Hard Carrier Type : $80 \sim 500$ g/cm² (1psi~7psi) for 8" wafer
 - 2) Flexible Membrane Type : $80 \sim 500$ g/cm²
- **Process** : Automatic sequence, Dry-in/Wet-out

Overview of POLI-762 for 4 ~ 12" Application

4"-12" Wafer CMP Equipment

Specifications

- **Head, Table** : 30 ~ 200 rpm, Rotational motion, Head oscillation ($\pm 12\text{mm}$)
- **Size** : 1730W 1780D 1950H mm
- **Platen size** : $\Phi 762$ mm (30 inch)
- **Pressing method** : Variable air pressure electronic controller
Membrane Type : 70~350 g/cm² (1psi~5psi)
- **Process** : Automatic sequence, Dry-in/Wet-out
- **Workpiece** : Max 12 inch wafer, (4~8inch compatible with optional carrier)

Characteristics

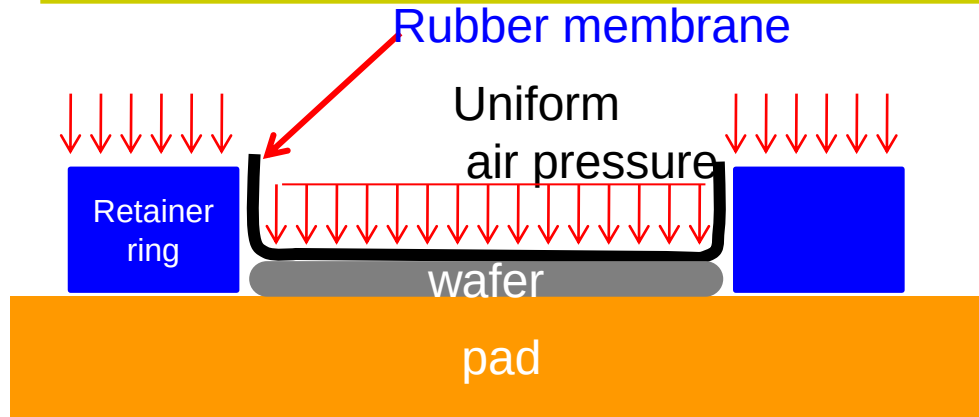
- 300 mm CMP Machine for R&D
- Stable repeatability (WTWNU<5%)
- High rigidity
- Wide application for CMP R&D

Chemical Mechanical Planarization for

Semiconductor, optics and MEMS



Membrane Head Technology (POLI-500, 762)



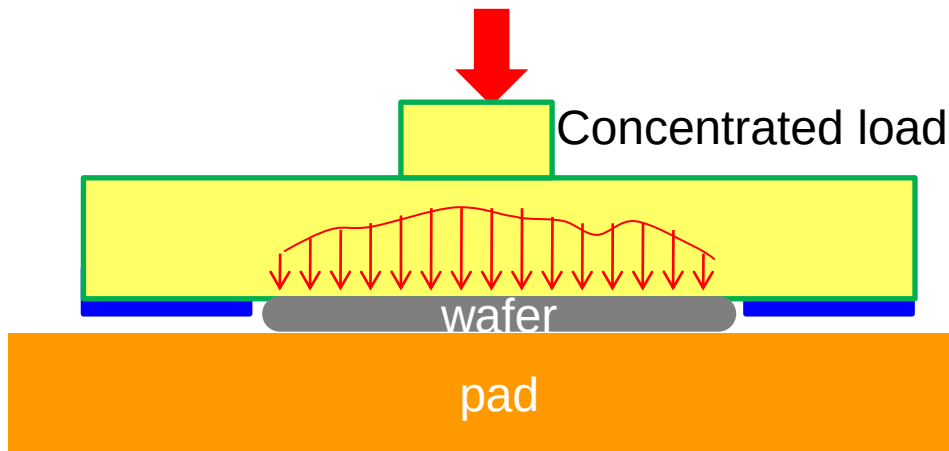
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Uniformity is most critical result after CMP and is mostly dependant on pressure uniformity on a wafer.

GnP uses thin rubber membrane to apply uniform pressure on a wafer, which results in very uniform CMP results.

All semiconductor industry uses membrane type head in CMP process for stable and better uniformity.



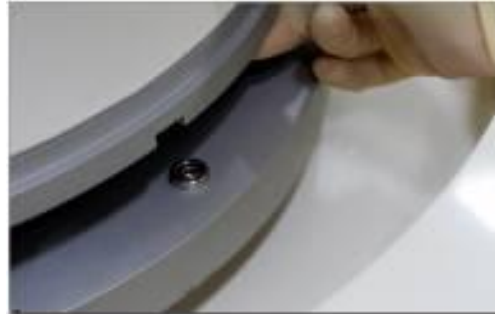
Old Type Carrier Head

Polishing pressure is controlled by axial force which is concentrated at the center of the head. (non-uniform pressure distribution)

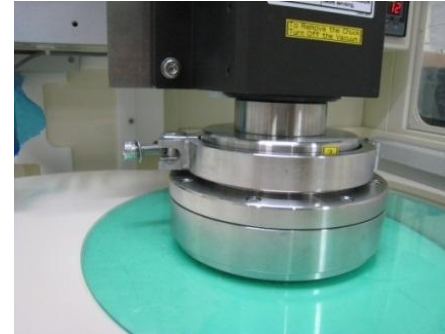
Additional backpressure control is required to achieve pressure uniformity(process control difficulty.).

Concentrated loading method is no more used in semiconductor fabrication.

Quick Changeable Platen and Carrier



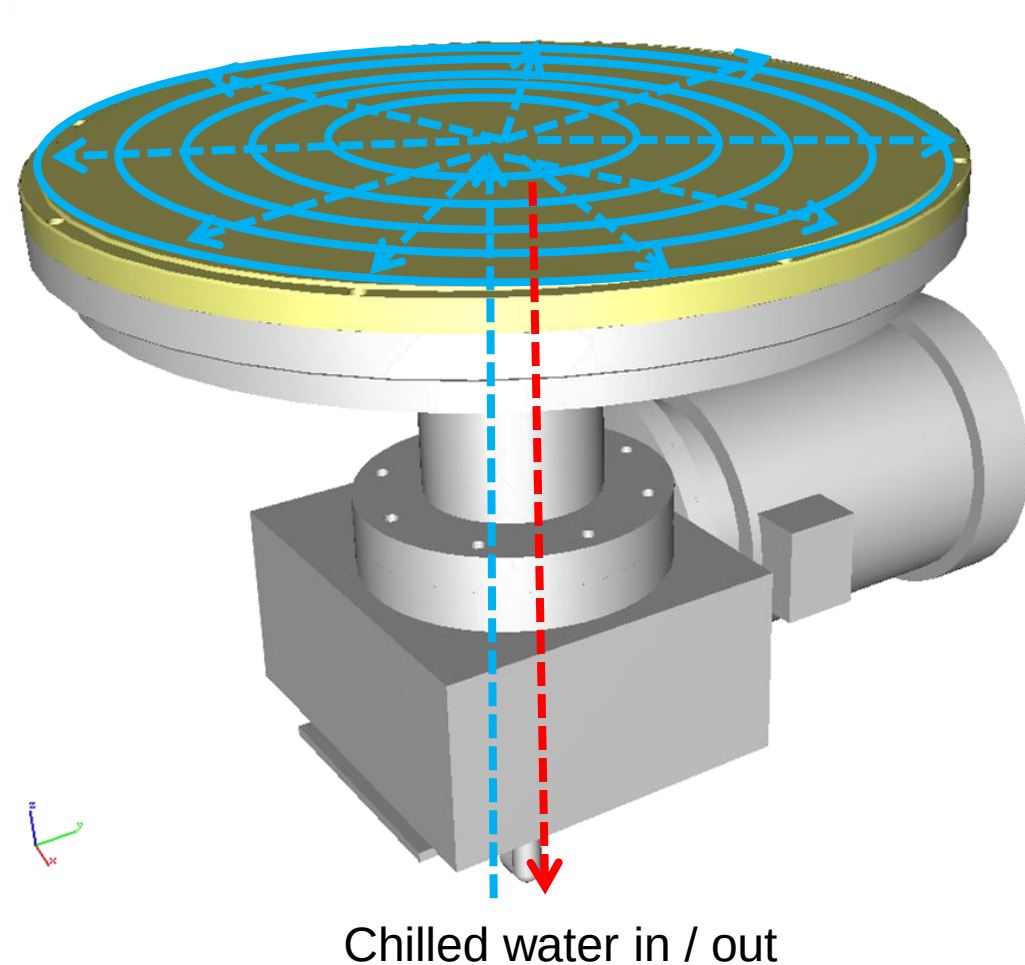
Quick changeable upper platen: Easy replacement of the upper platen is great advantage for multiple material CMP to prevent cross contamination and to maximize pad lifetime.



Quick changeable head structure ensures fast change of process from different size of wafers. GnP's quick change technology is very useful for customers who frequently handles different size of wafers.

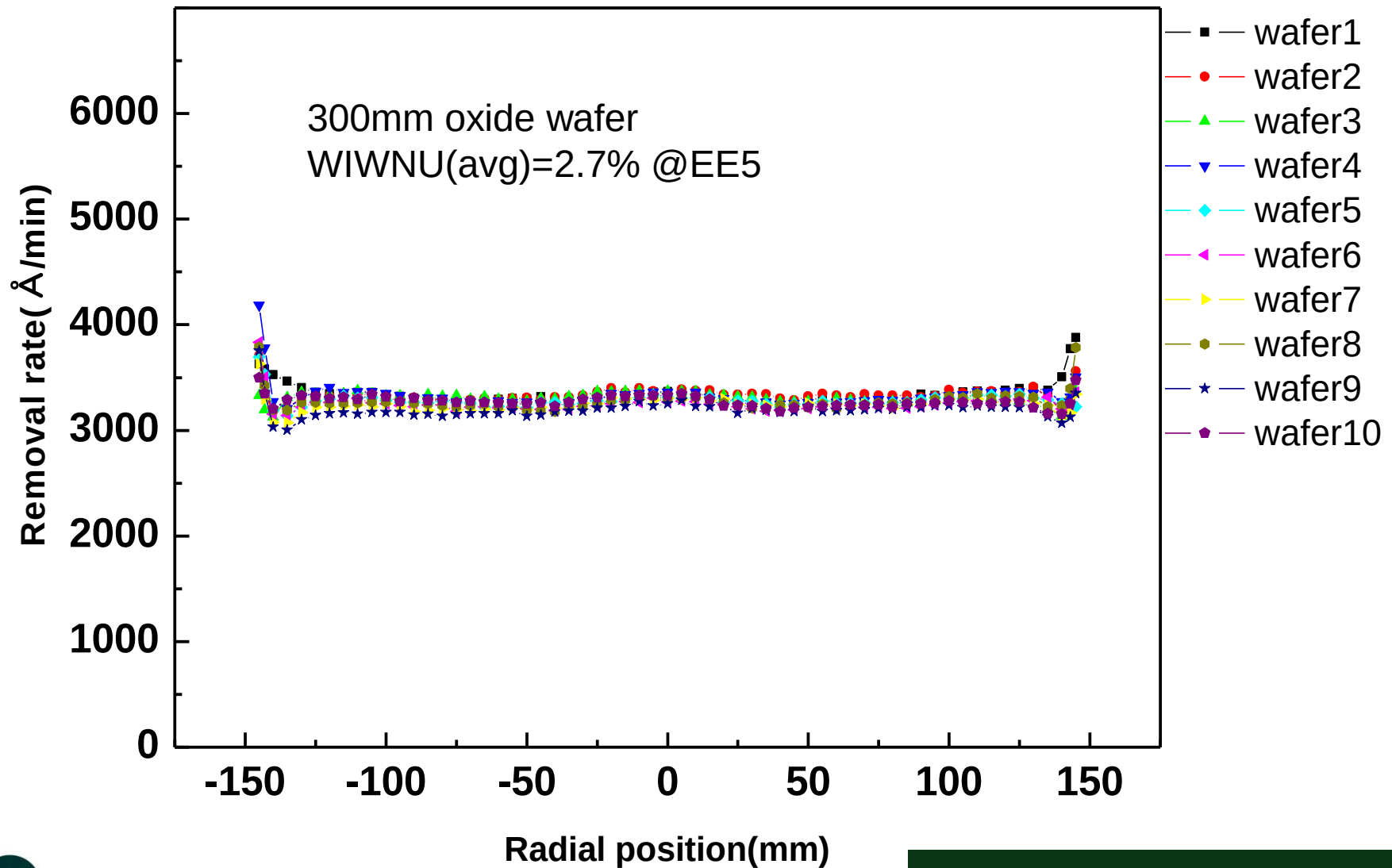
Platen Temperature Control Channel (POLI-500, 762)

- Platen cooling channel allows consistent operation of CMP
- Temperature stability can be maintained by external chiller (not included)
- Highly conductive metal platen to prevent heat build-up

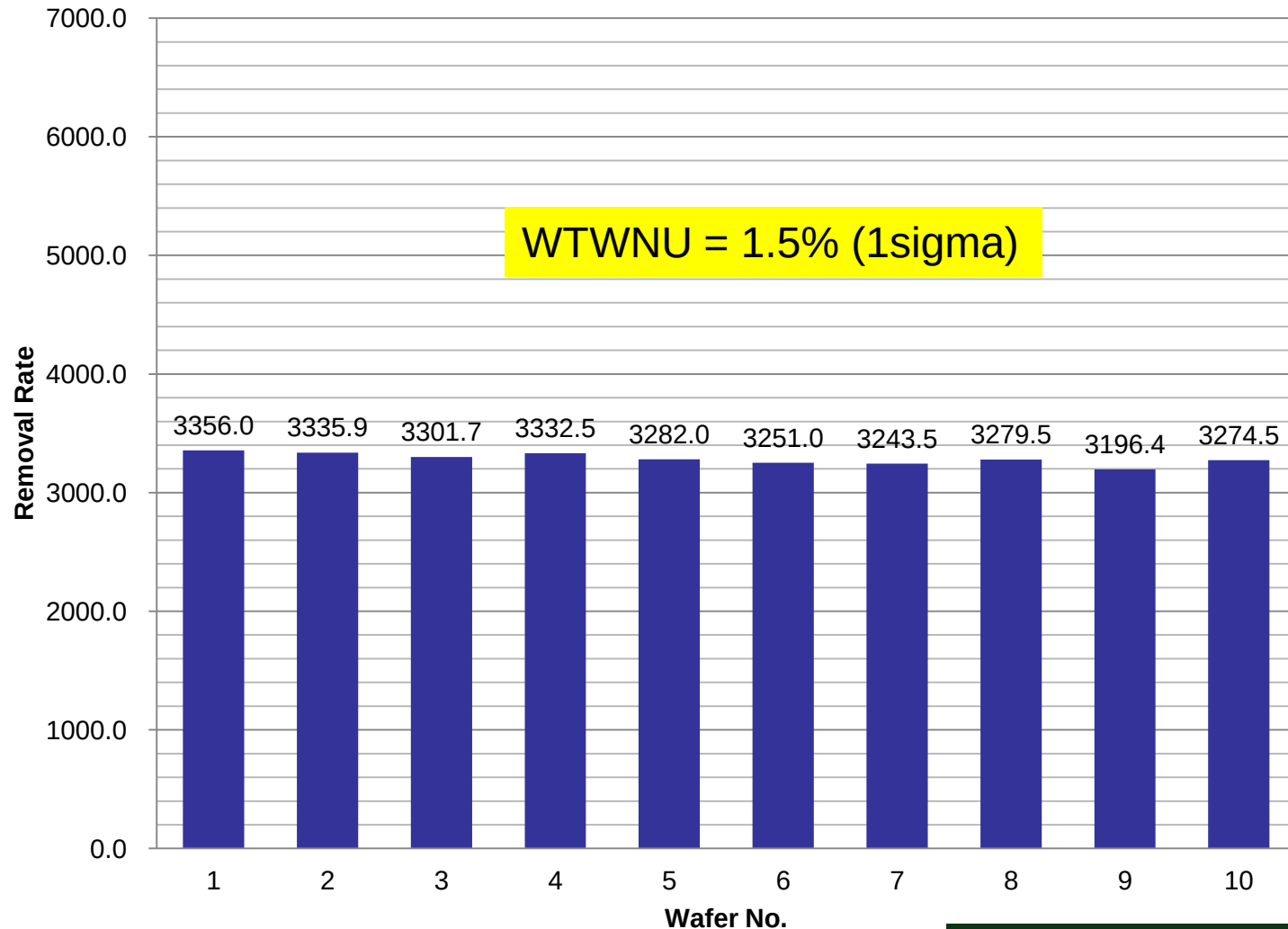


Chilled water in / out

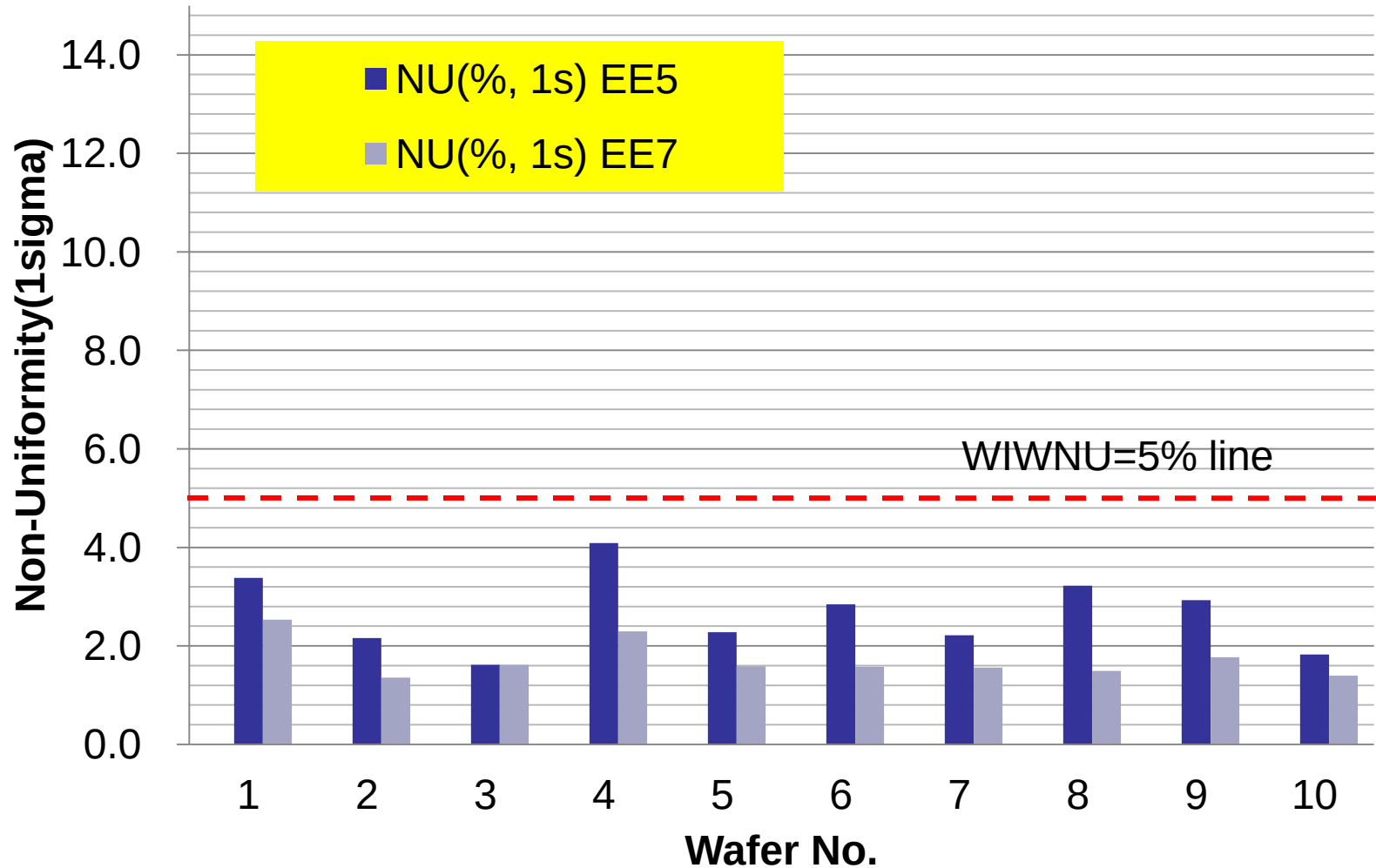
Performance (Removal Rate Profile)



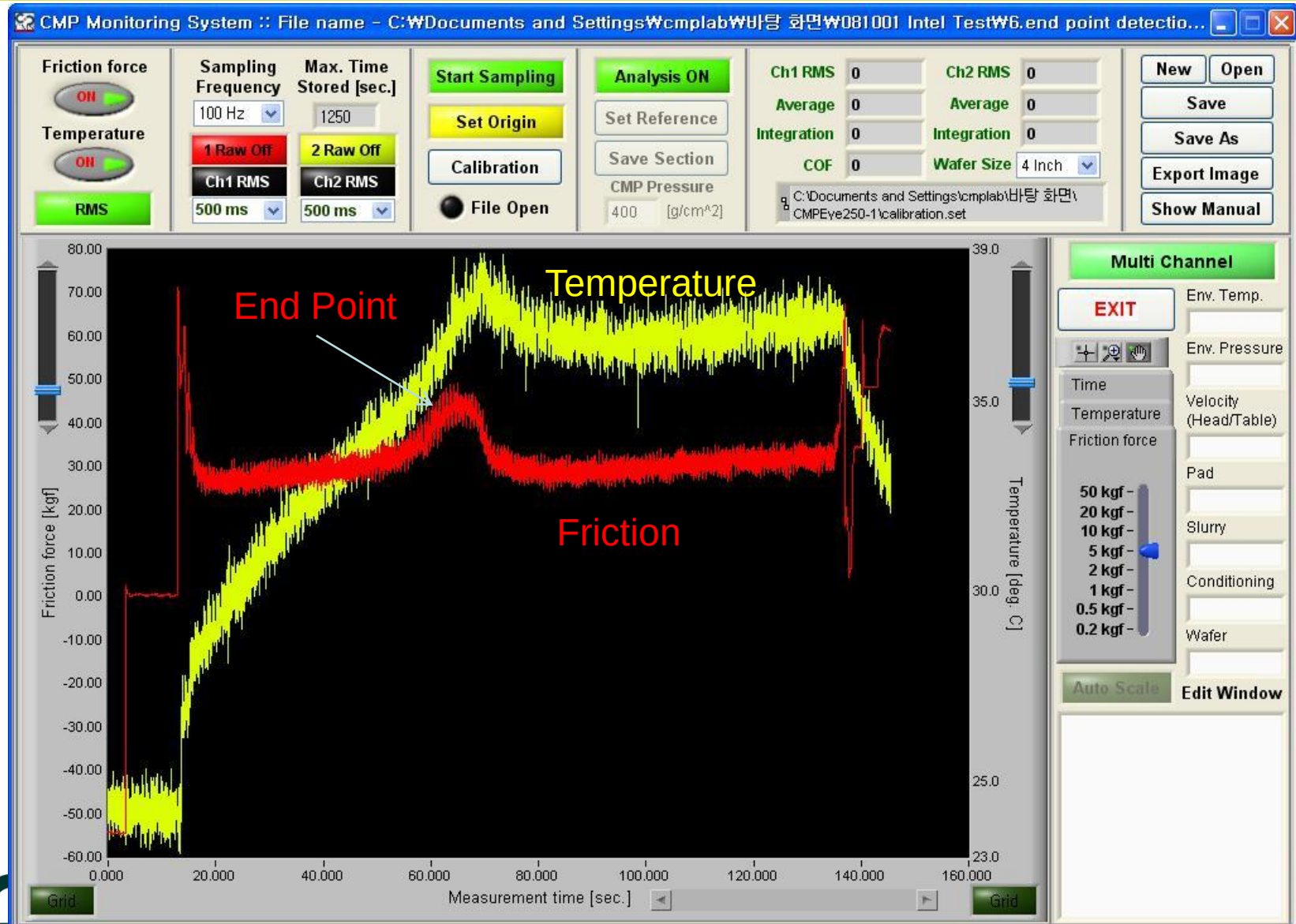
Performance (Wafer to Wafer Consistency of Removal Rate)



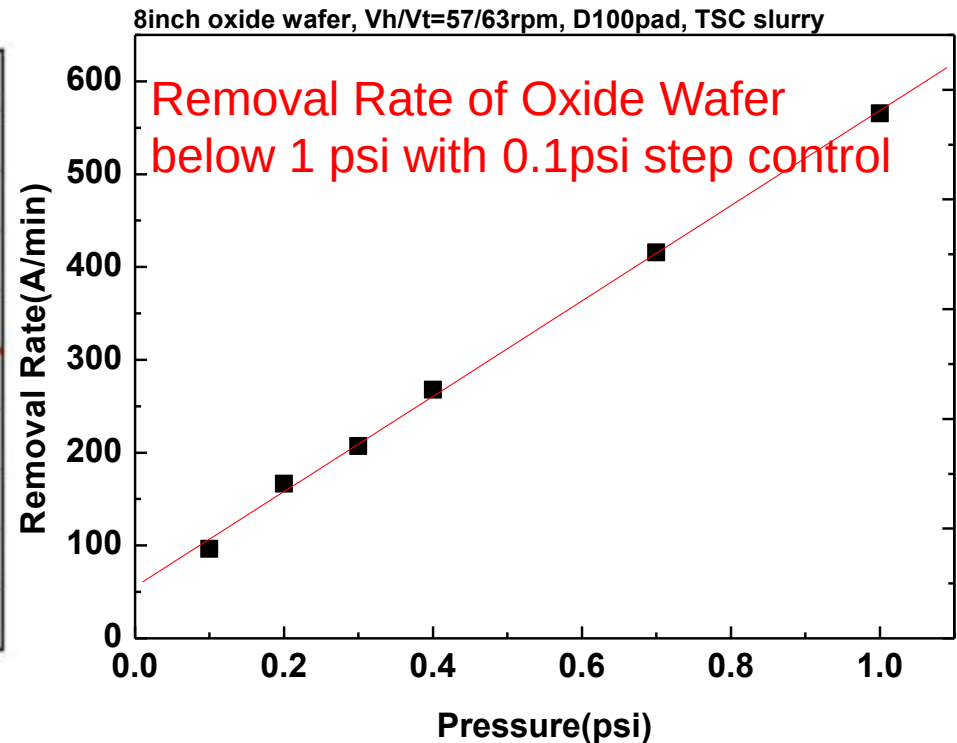
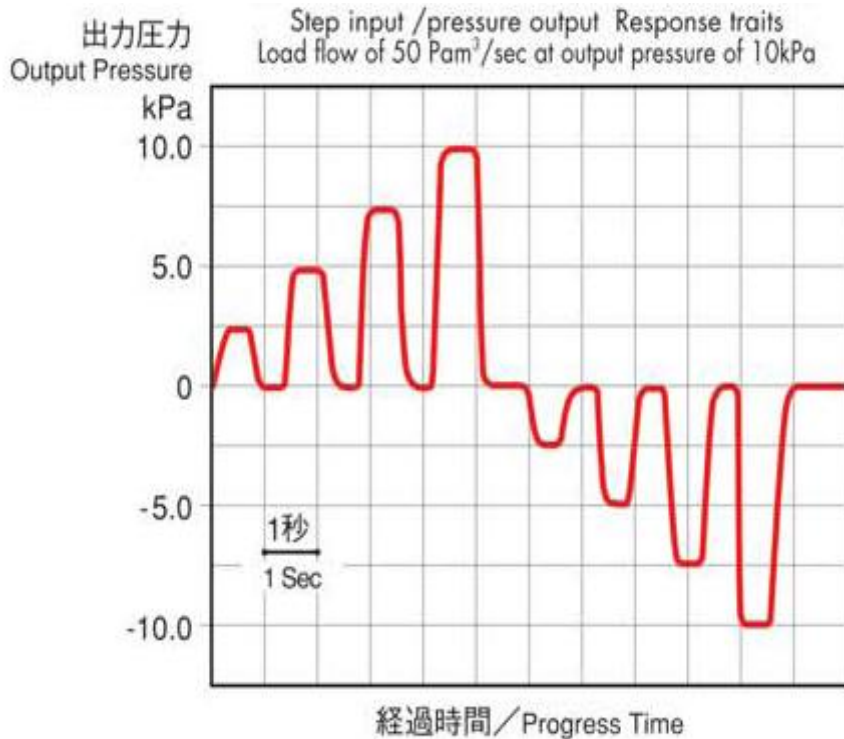
Performance (Within Wafer Nonuniformity of Removal Rate)



Friction and Temperature Monitoring Option

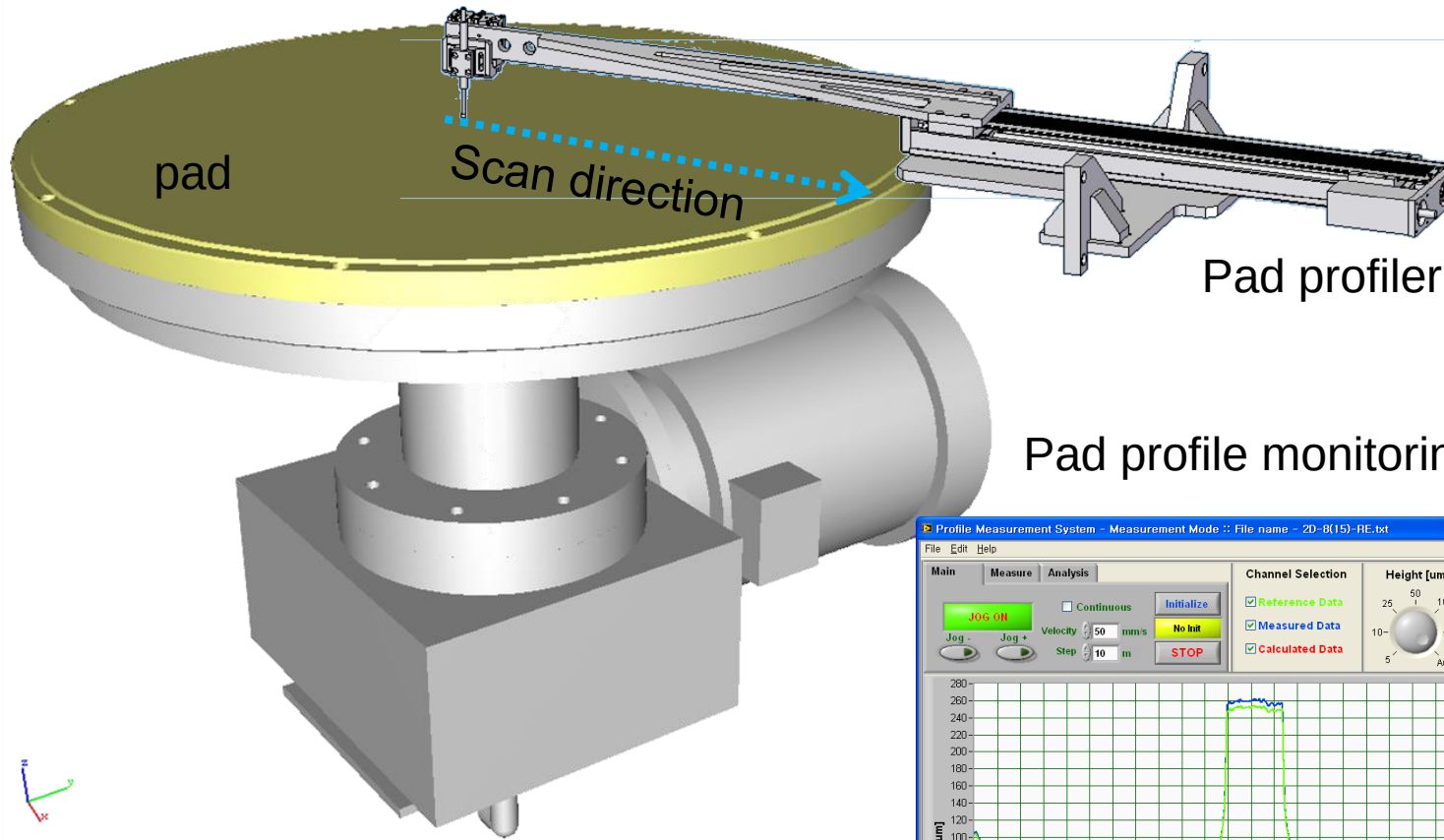


Low Pressure Pneumatics Option (0.1~5psi control)

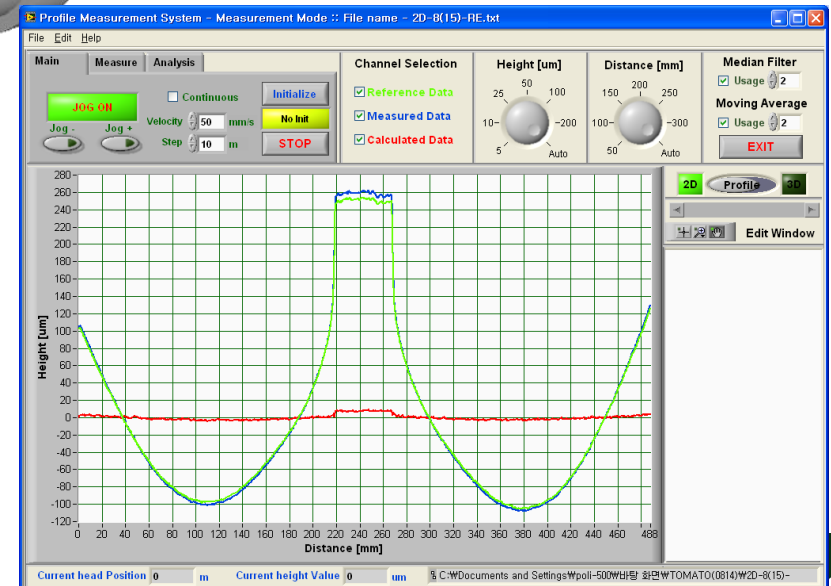


With low pressure pneumatic option, pressure control range is down to 0.1 psi with 10 times precise resolution than normal pneumatic system (resolution < 1g/cm²).

On-Machine Pad Profile Monitoring System Option



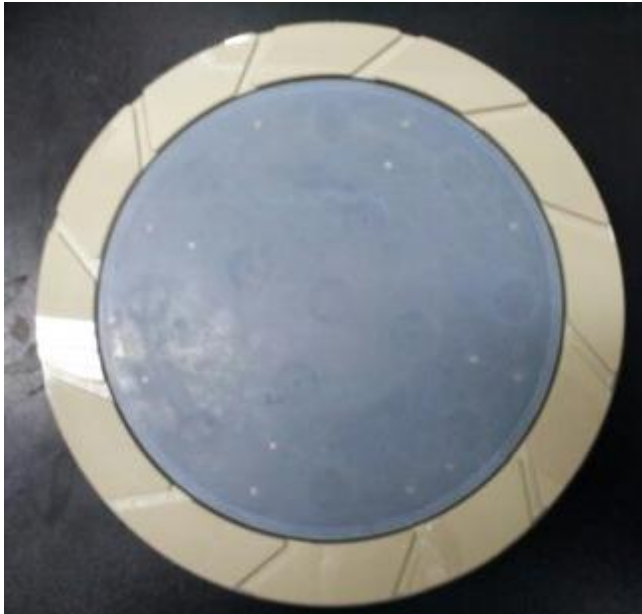
Pad profile monitoring program



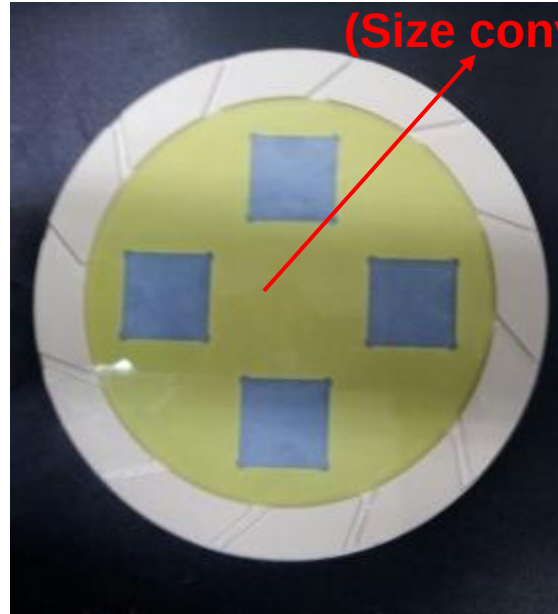
Small Size Coupon Wafer Application Function

- EPC ring for coupon wafer polishing by using 8inch wafer carrier
- Small size wafers (e.g. 2", 3") can be processed the same way.

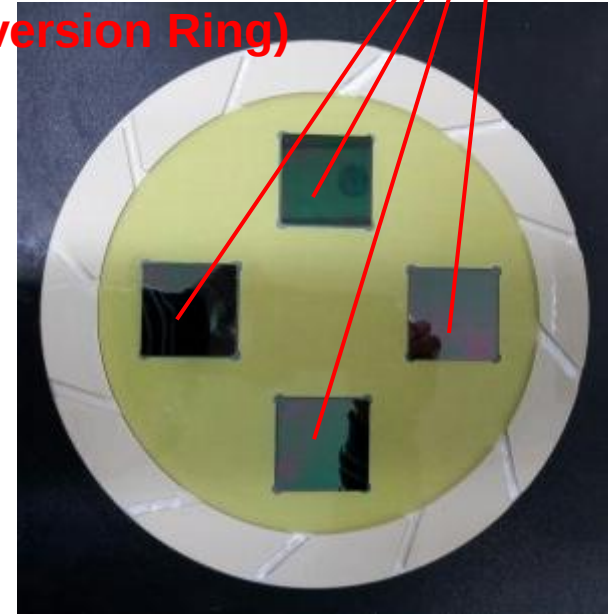
8inch wafer carrier



**EPC Insert ring
(Size conversion Ring)**

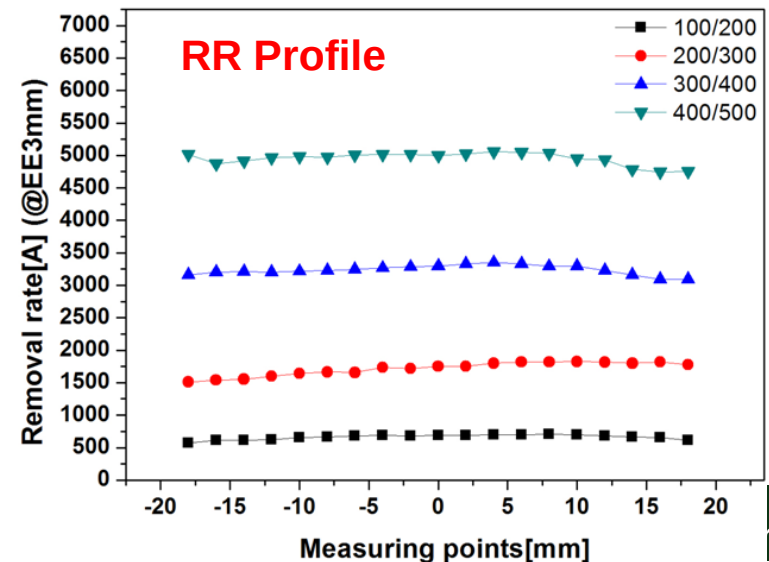
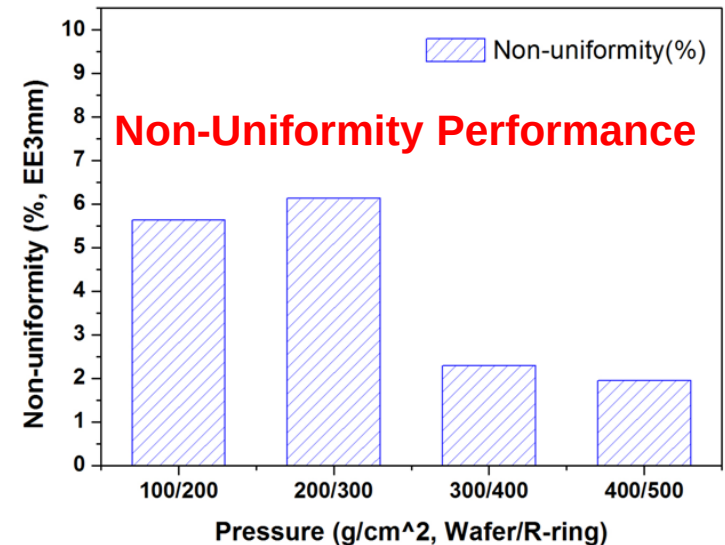
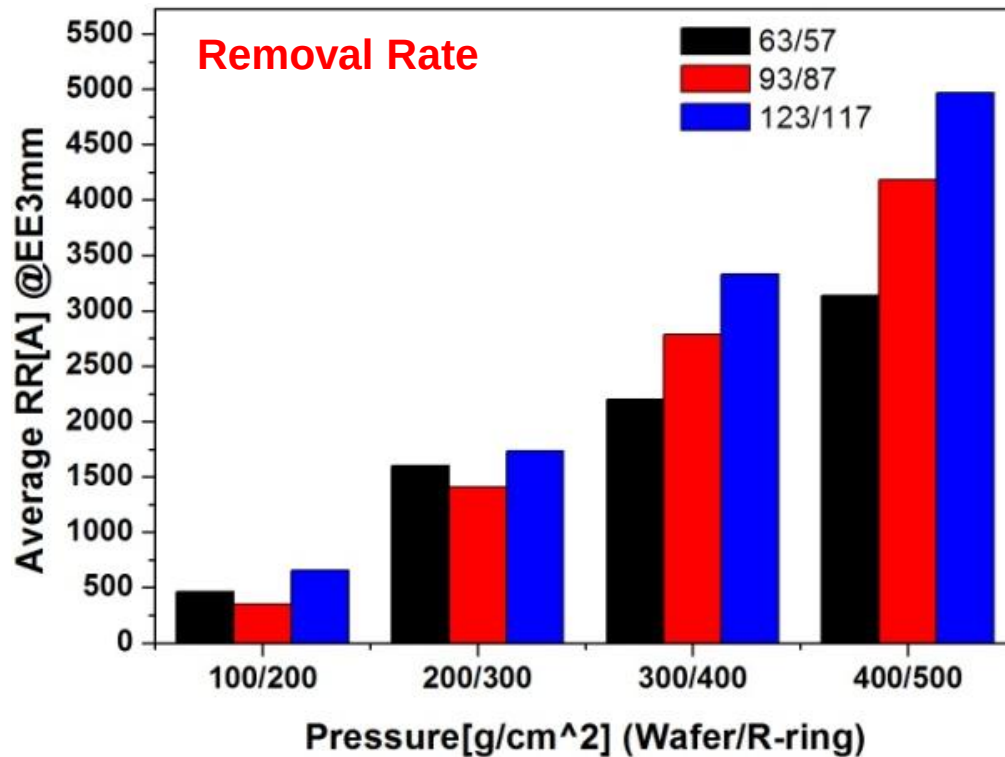


Coupon wafer



- The sliced coupon wafers such as Oxide, Cu, W and patterned wafer can be polished with membrane carrier head by using EPC ring.
- Uniform pressure can be applied on each coupon wafers during a polishing.
- Non uniformity of coupon oxide wafer polished by EPC ring is 3~5% at EE3mm.

Polishing Performance with Coupon



Pressure and Velocity Effect on Removal Rate

G&P's Post CMP Cleaners



Chemical Mechanical Planarization for
Semiconductor, optics and MEMS



G&P TECHNOLOGY