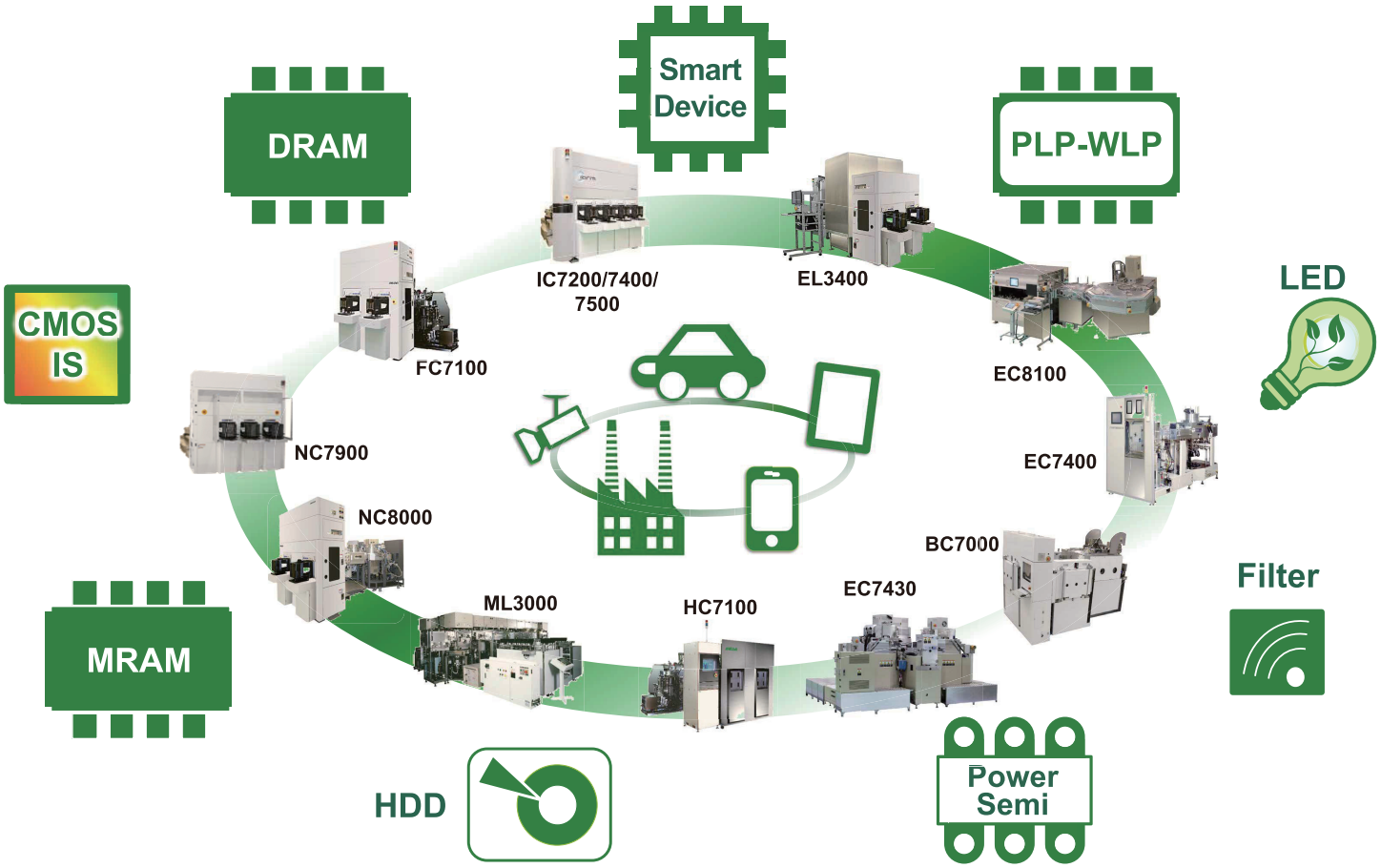
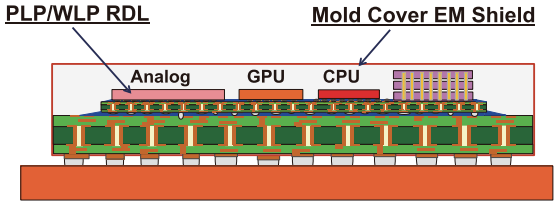
Equipment Products Line Up

Explore vacuum technology to the future

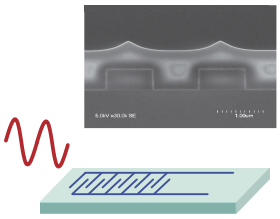


Major Process Applications

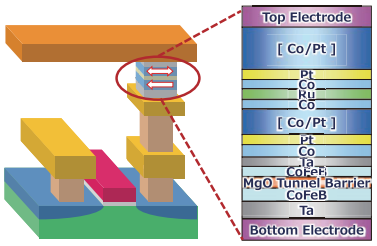
Advanced Packaging



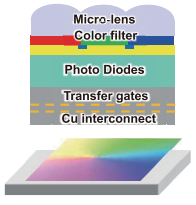
SAW Device



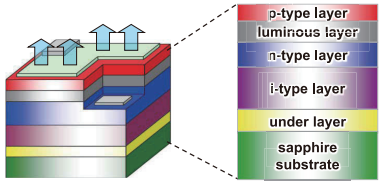
MRAM



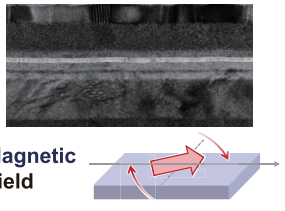
CMOS-IS



LED



Magnetic Sensor

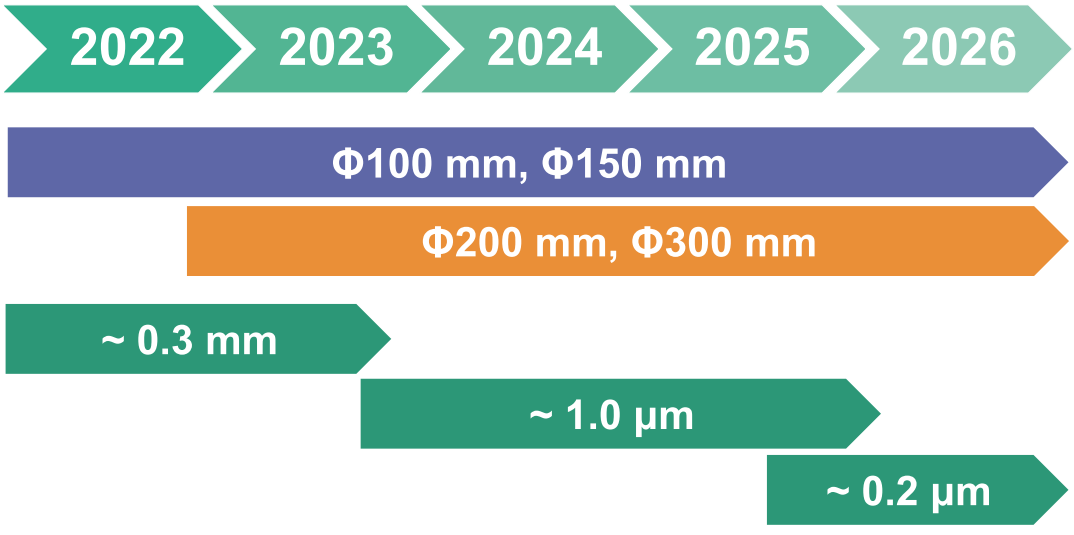


Atomic Diffusion Bonding (ADB) Equipment BC7000

Applicable for High-Volume Manufacturing and R&D
Deposition & Bonding Combination Module

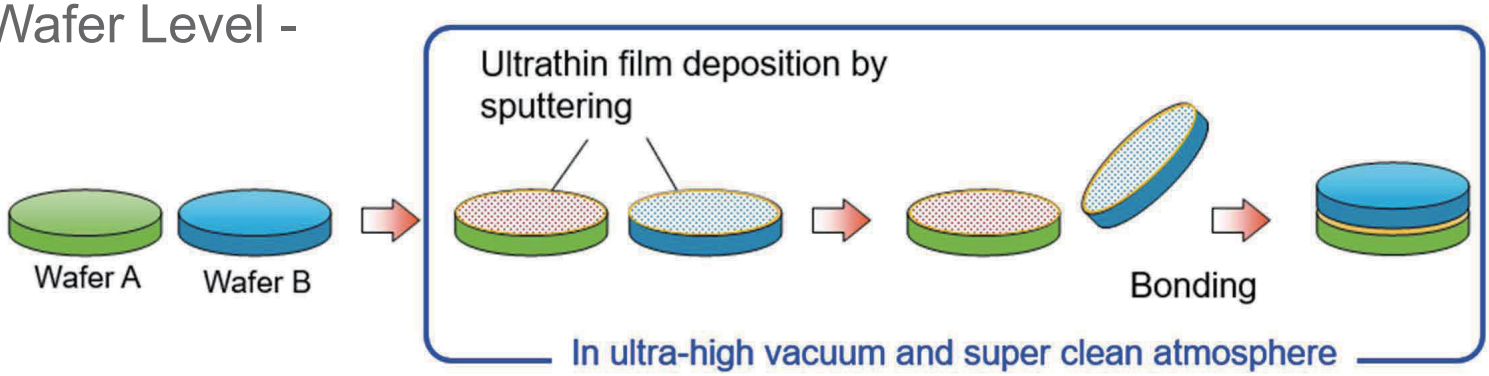
- Bond at room temperature
- No applied pressure required
- Use any metal as bonding layer
- Bond similar or dissimilar materials
- High strength permanent bonds

Development Roadmap

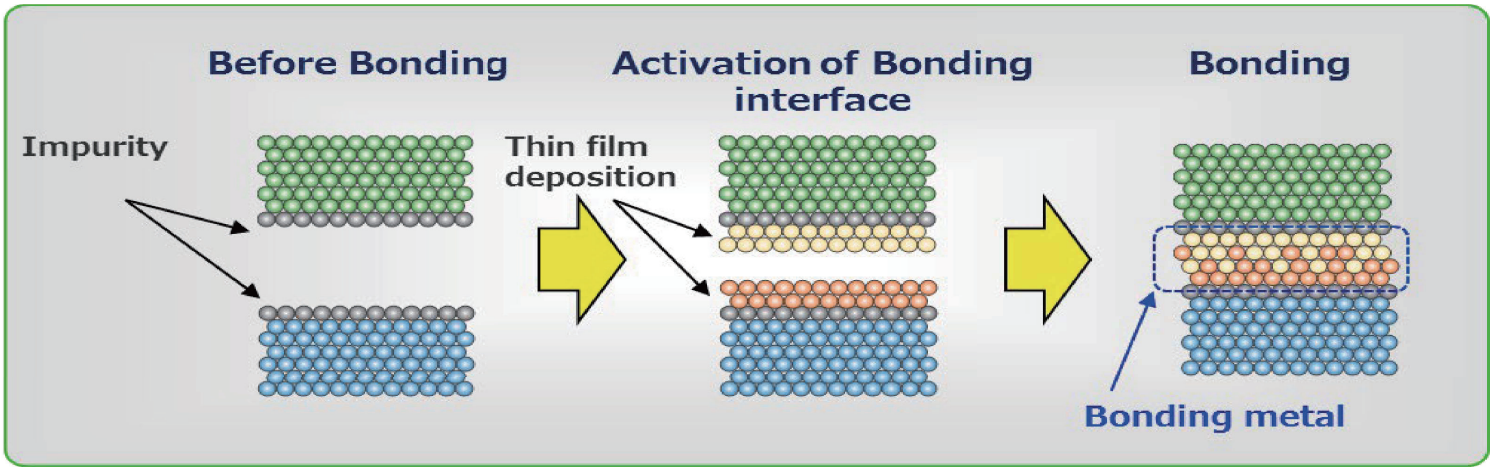


ADB Technique & Results

Wafer Level -

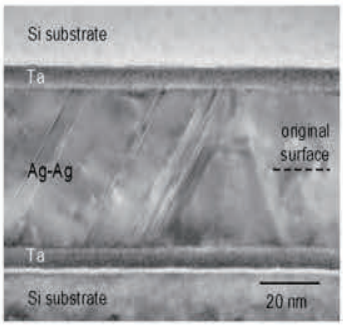


Material Level -

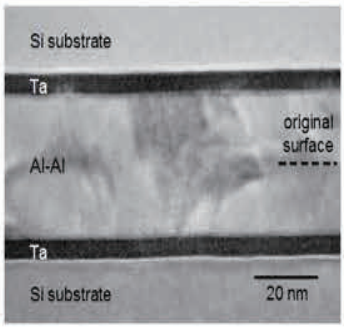


Microstructure Level - Examples

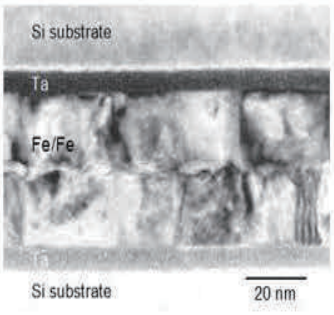
(fcc structure) (bcc structure)



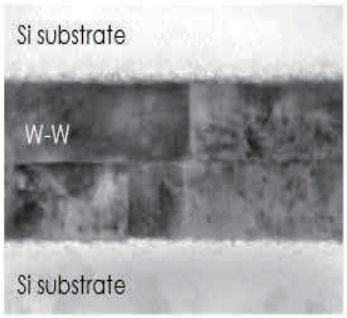
Ag – Ag bond



Al – Al bond



Fe – Fe bond



W – W bond

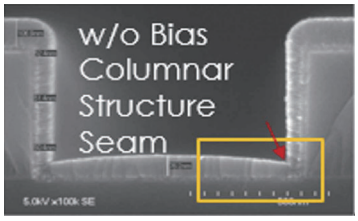
Bonding strength depends on *D* (self diffusion coefficient) of the bonding material

PDC – New Deposition Solution

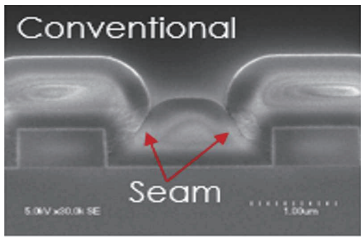
EC7430 – PDC
PLABAS (Plasma Balanced System) Dual Cathode

Novel sputtering technology for insulator and dielectric materials.
High performance through independent bias control.

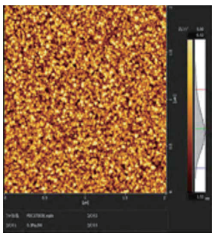
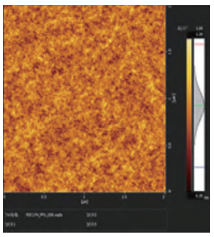
Coverage Quality

d 0.5 µm W 1.0 µm (AR 0.5)		
Top/Bottom/ Sidewall	106.4 nm / 76.2 nm / 50.4 nm	94.1 nm / 70.3 nm / 47.5 nm
Bottom Coverage%	72%	75%
Sidewall Coverage%	47%	51%

Trench Filling

AR = 0.5 (500 nm / 1000 nm)		AR = 1.4 (500 nm / 350 nm)
		

Surface Roughness

w/o Bias	w/ Bias
	
Sa:0.997 nm Sz:9.653 nm	Sa:0.090 nm Sz:1.240 nm

Less Contamination –

Element	Al	Ti	Cr	Fe	Co	Ni	Cu	In
Detection limit (10^{10} atoms/cm^2)	56.569	0.707	0.283	0.141	0.141	0.141	0.283	7.071

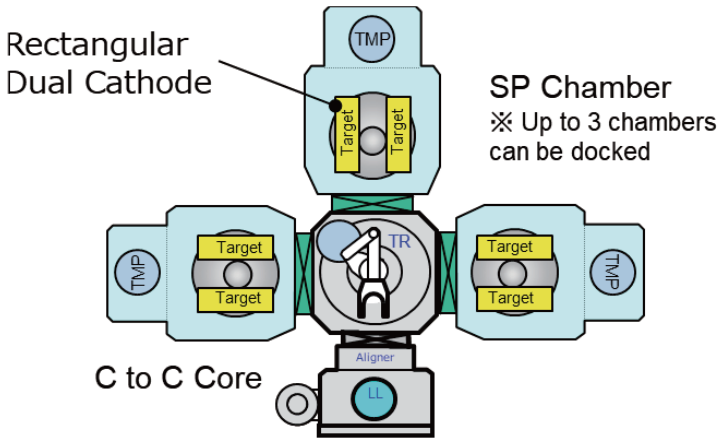
All Metals below detection limit
SiO2 film thickness = 35 nm. Condition: 0.3 Pa, 3 kW, bias 250 W by TXRF

PDC – Hardware Overview

EC7430 – PDC
PLABAS (Plasma Balanced System) Dual Cathode

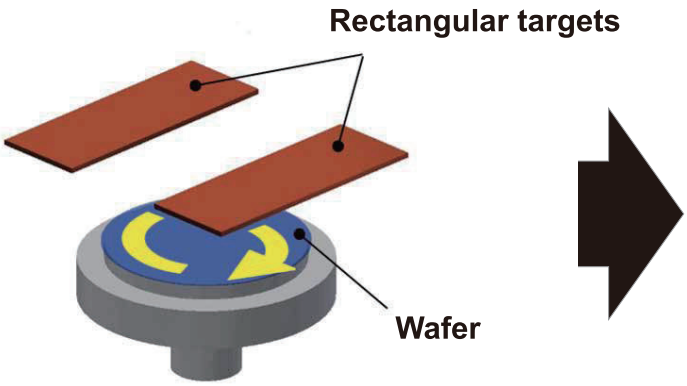
Tool Outline -

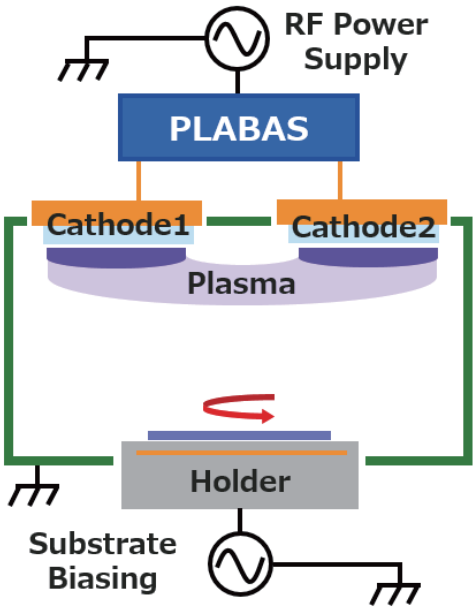
Appearance



HVM Cluster Tool Outline

Unique Dual Cathode Design -





Twin cathodes, substrate rotation,
and adjustable target-to-substrate spacing.