

# New Bonding Solution

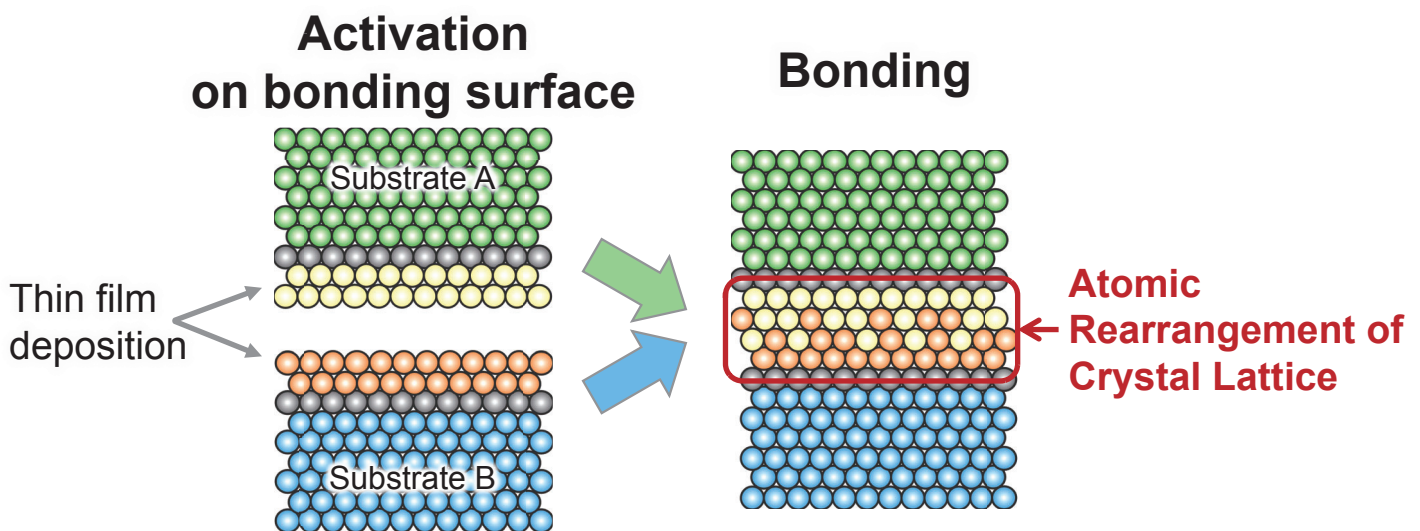
*Room temperature bonding process*

*No high pressure required*



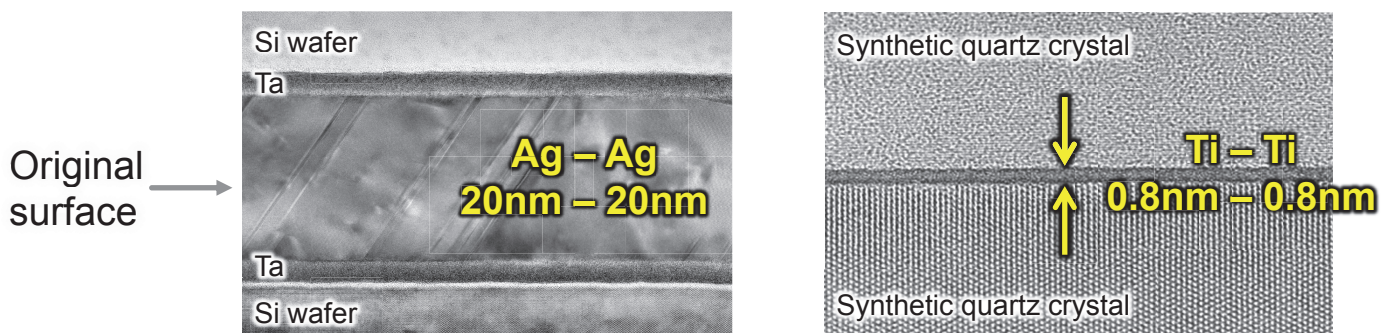
... Realized by

## Atomic Diffusion Bonding Technology



*High strength permanent bonding*

*Almost any metal film can be used*

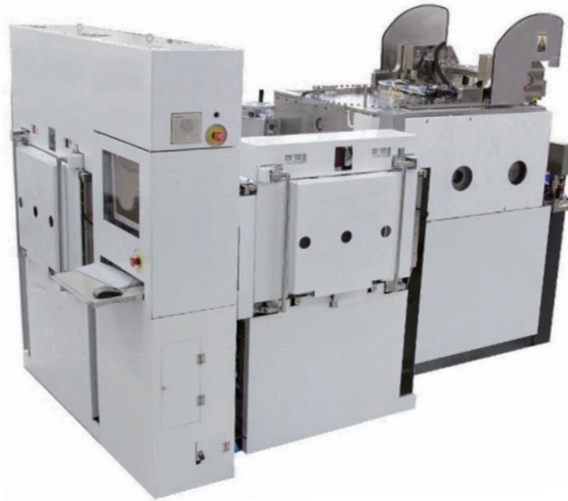


Courtesy of Frontier Research Institute for interdisciplinary Sciences, Tohoku University, Shimatsu Lab.

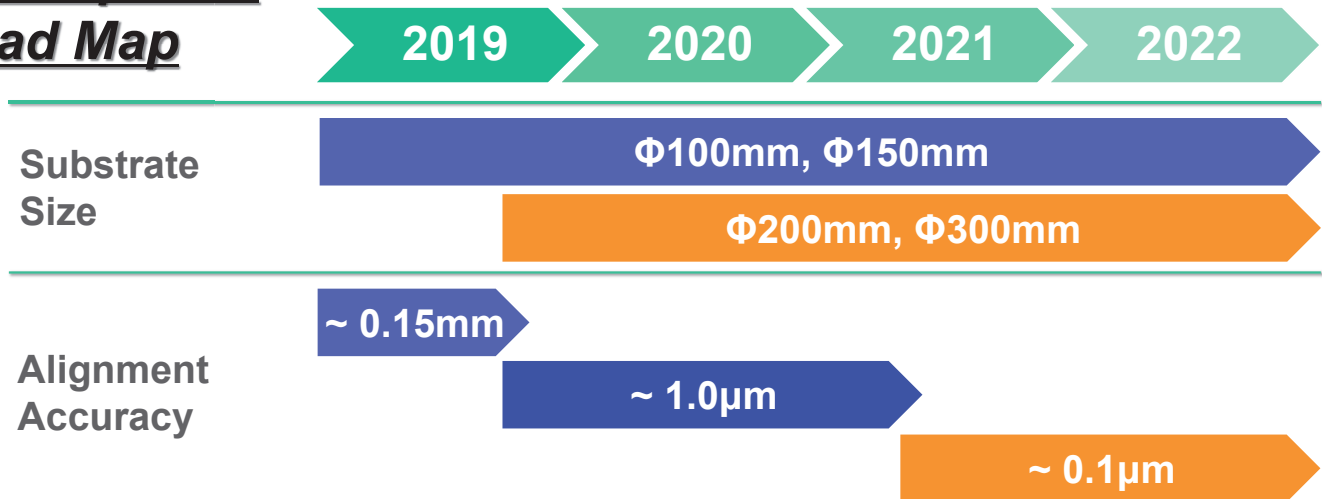
# Atomic Diffusion Bonding Equipment

## BC7000

Usable in R&D and High Volume Manufacturing  
Deposition & Bonding Combination Module



### Development Road Map



#### Academic Research



Tohoku University  
Shimatsu Lab.

#### Equipment Development

**Canon**

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# Surface Roughness Control for Bonding

$R_a < 0.3\text{nm}$  required for bonding

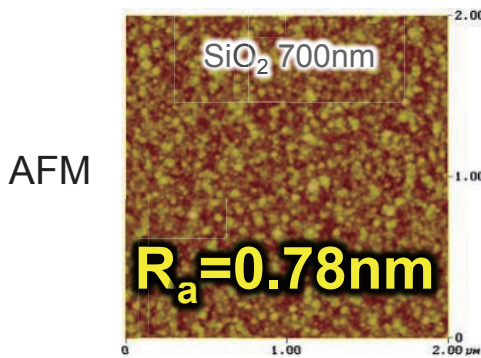
... Realized by

## Energy Treatment Sputtering

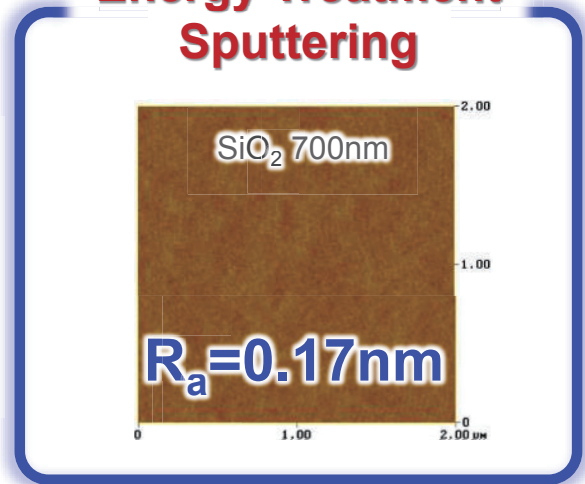
Surface roughness improvement by new deposition method

### Fabrication of high smooth PVD film

Conventional Sputtering

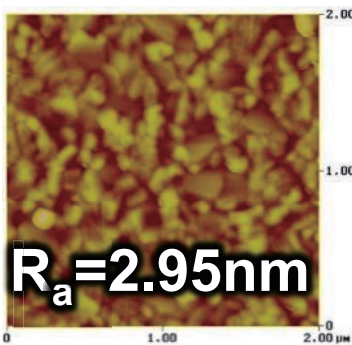


Energy Treatment Sputtering

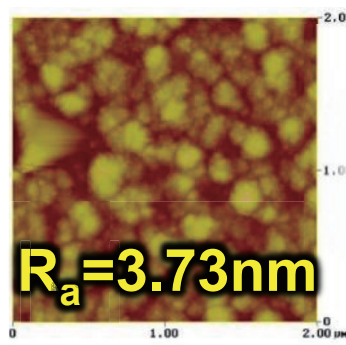


### Smoothing of rough surface by depo.

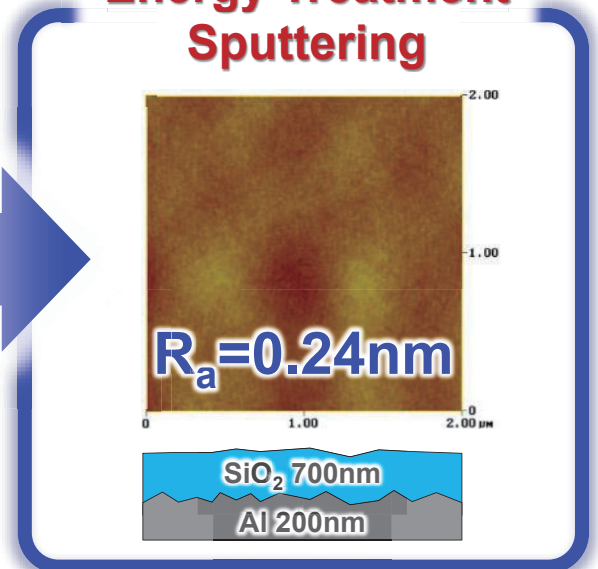
Initial Surface



Conventional Sputtering



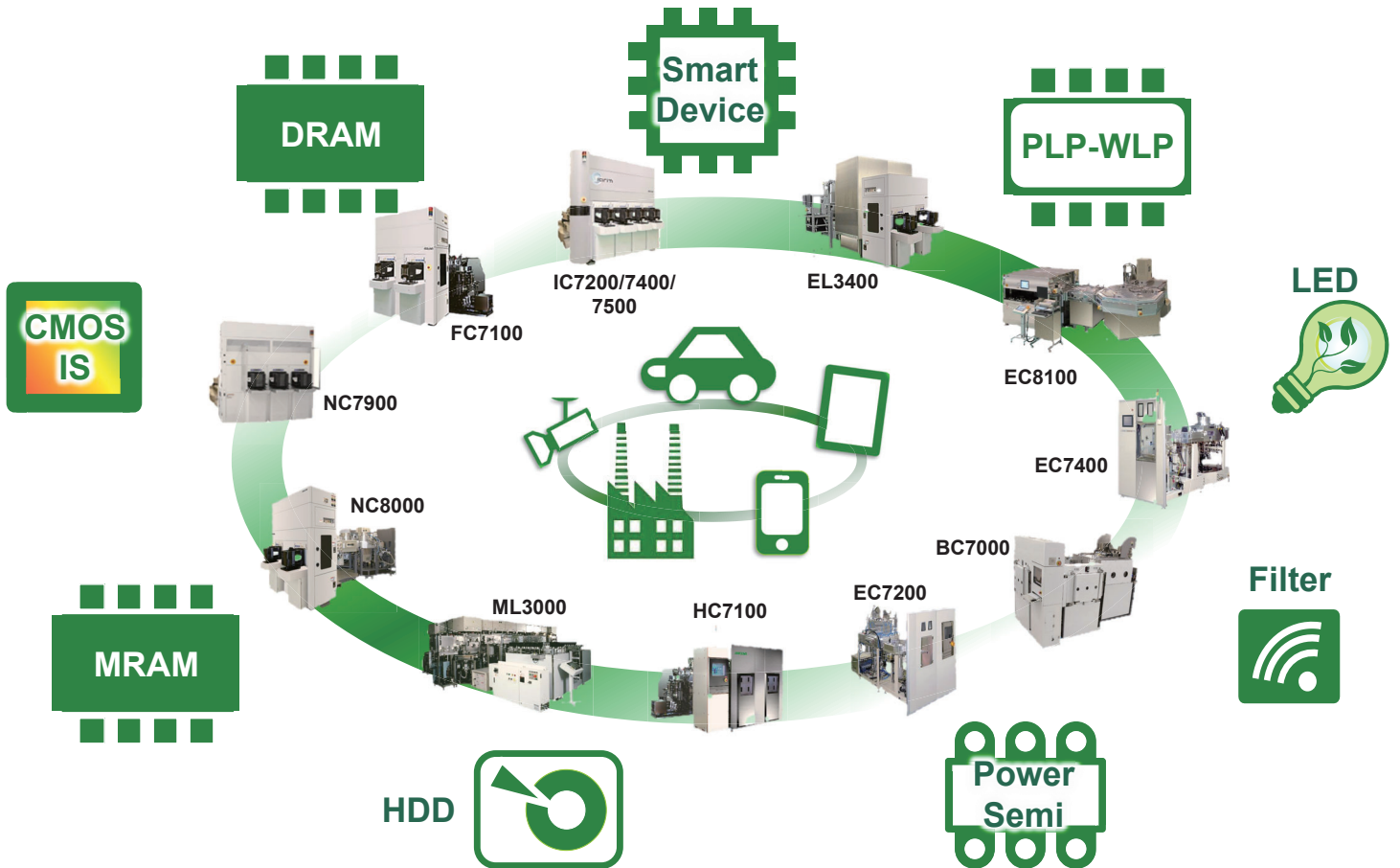
Energy Treatment Sputtering



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## Equipment Products Line Up

Explore vacuum technology to the future



### Major Process Applications

