



## SEAL SP7 – TCB300 NEW SOLUTIONS FOR 300MM TEMPORARY CARRIER BONDING

### AT A GLANCE

Handling of extremely thinned  
silicon device wafers  
Processes and equipment  
assessment

### SEAL SP7 – PARTNERS

Süss MicroTec  
Imec  
STMicroelectronics Crolles



**FIGURE 1:** PICTURE OF SUSS 200/300MM WAFER BONDER  
XBC300 FOR TEMPORARY AND PERMANENT BONDING

### Advances in TCB300

- Main differentiator: both bonding and debonding using classical thermoplastic glue materials, as well as a novel bonding and debonding process
- Circumvents the limitations of thermally or light assisted carrier release process
- Enables the use of cheap carrier substrates such as silicon wafers.
- Solution involves:
  - Application of the glue medium by spin-on deposition Wafer bonding at low forces, and
  - Low temperature debonding by peeling
- The non-thermal nature of the debonding process widens the scope of application (e.g. memory products, or microbumped devices).
- Debonding by peeling as enabled reduces the risk of damaging the device wafer surface.



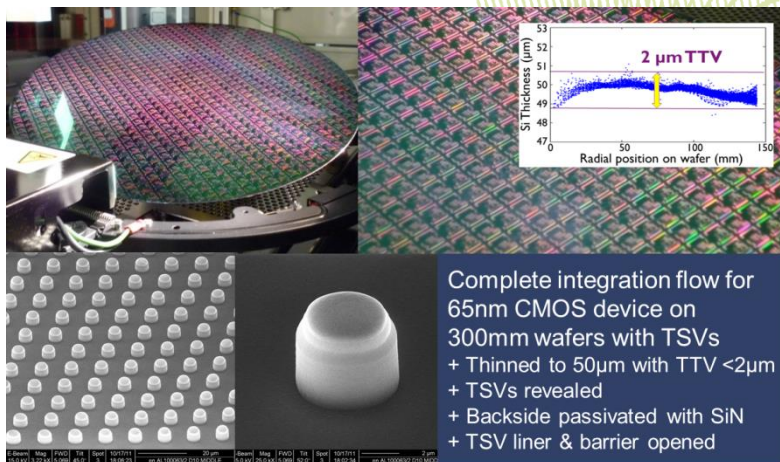
## SEAL SP7 – TCB300 NEW SOLUTIONS FOR 300MM TEMPORARY CARRIER BONDING

### SEAL PROJECT MANAGEMENT

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### Project Results

- Limits for industrial use of the conventional thermal-slide debond process for 3D IC applications examined and determined
- New ZoneBond process based on room temperature peel off debonding evaluated and qualified for 200mm and 300mm wafers
  - New glue material -> bonder hardware modified to match requirements
  - Coating and bonding process for 20µm adhesive thickness optimized with respect to the TTV targets
  - Process and Hardware Optimization on the new peel off debonder DB12T
  - Wafer on taped-frame cleaning process qualified (post debond)
  - Electrical testing of CMOS test wafers passed
  - Overall process released in pilot line



**FIGURE 2: TOTAL THICKNESS VARIATION RESULTS AFTER BONDING (ZONEBOND) AND THINNING**

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