SÜSS MicroTec

CAPITAL MARKETS DAY - STERNENFELS

- BONDER -

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OVERVIEW BONDER SEGMENT

- Solutions for temporary and permanent bonding
- Automated, semi-automated and manual equipment
- Target markets are 3D-TSV, MEMS and LED
- Order entry 2017: € 36.7 million
- Sales 2017: € 22.1 million
- EBIT 2017: € 3.3 million

WAFER BONDER CORE TECHNOLOGIES

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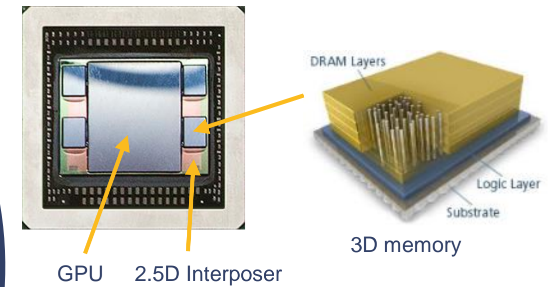
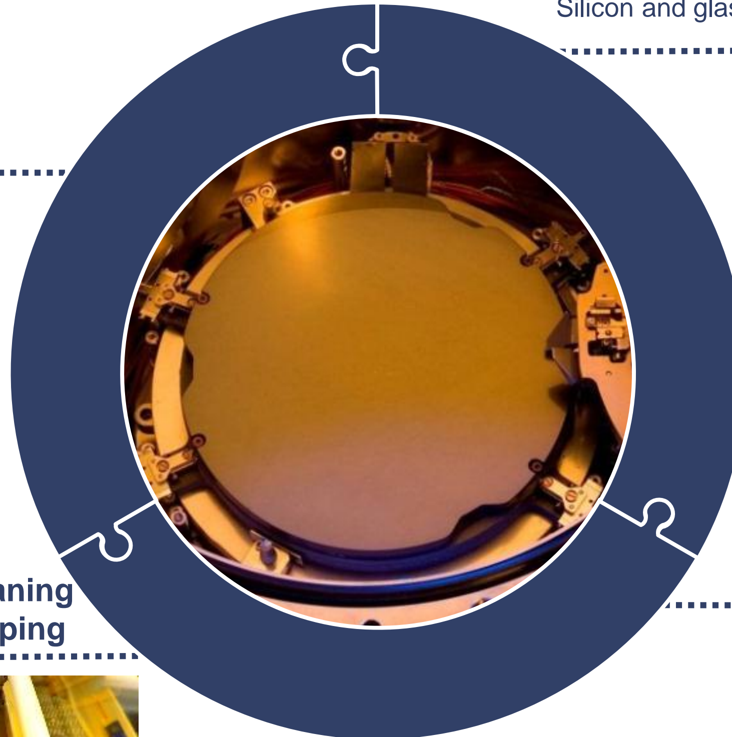
Permanent Bonding Technologies

Eutectic Bonding
Metal Diffusion Bonding
Glass Frit Bonding
Anodic Bonding
Adhesive / Polymer Bonding
Hybrid / Fusion Bonding

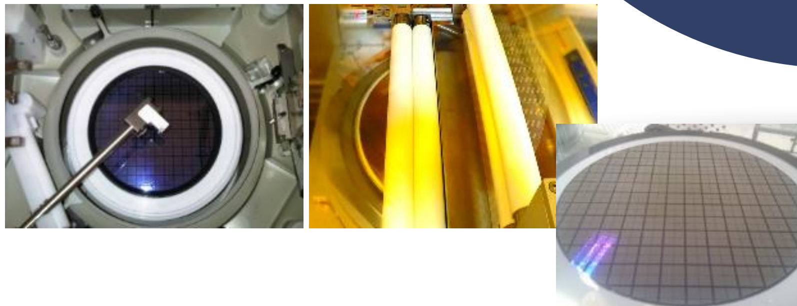
Temporary Bonding for 2.5D and 3D

Different adhesive systems
Silicon and glass carriers





Tape Mounted Thin Wafer Cleaning with Tape Protection and Detaping

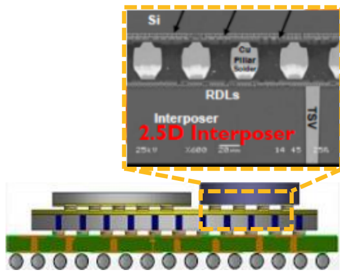


Mechanical- and Excimer Laser Assisted Debonding

MAIN MARKETS BONDERS – 2.5D AND 3D INTEGRATION

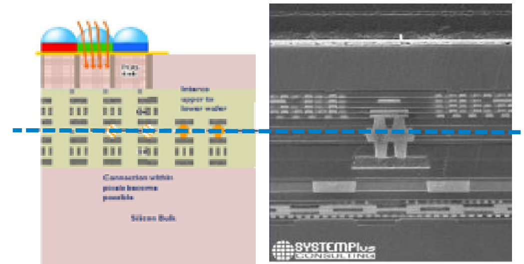
2.5D / 3D TSV equipment market is forecasted at **~25% CAGR** (2018-25) [1)]

+ Main drivers for 2.5D / 3D are performance increase and lower power consumption / footprint
+ TSVs are used in 3D memory and for heterogeneous integration (2.5D Interposers, MEMS and CIS) [1)]
  - High Bandwidth Memory (HBM) market forecasted at ~29% CAGR (2017 - 2022)
  - 3D CMOS Image Sensor (CIS) market forecasted at ~10.5% CAGR
+ Temporary bonding / debonding, wafer to wafer (W2W) permanent bonding (hybrid / fusion bonding) and (collective) die to wafer (D2W) and are the major enabling technologies

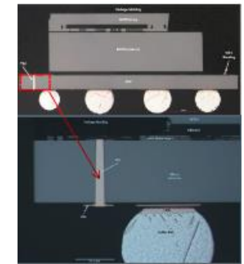


2.5D interposer (tsmc)

3D HBM memory (Samsung)



CMOS image sensor (Sony)



MEMS on ASIC (Bosch)

XBS300

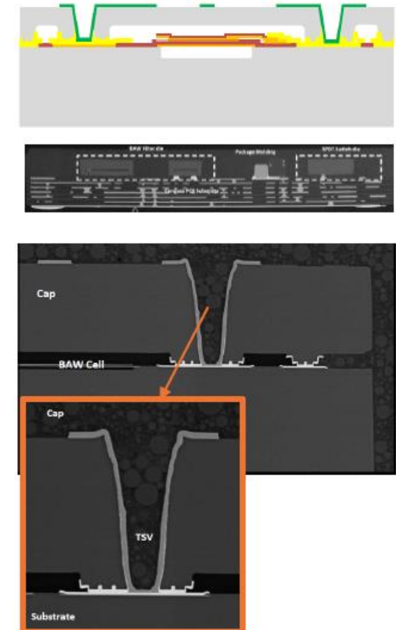
XBC300 Gen2

Source:
1) *Yole Développement*

MAIN MARKETS BONDERS – MEMS AND RF-MEMS

Overall number of shipped MEMS wafers is forecasted at **~5% CAGR** (2016-22)

- Largest growth drivers
  - RF-MEMS ~25% CAGR (2016-21) – filters, tuners, switches for high bandwidth messaging, streaming
  - Inertial combos ~13% CAGR (2016-21)
  - Microphones ~10% CAGR (2016-21)
- Main permanent bonding methods today
  - Hybrid / fusion bonding (CIS, MEMS)
  - Eutectic bonding (inertial MEMS, e.g. AlGe)
  - Adhesive-, metal diffusion- and TLP (transient liquid phase) bonding
- Future trend is low temperature metal- and hybrid / fusion bonding



Multi-die System in Package with BAW filter, switches, … (Avago / Broadcom)

XBS200

XB8

SB6/8 Gen2

Source:
Yole Développement

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