Tmap
Dual 3D

FOGALE *nanotech*

Metrology solution for **3D IC/TSV** process control

Unique on the market

Patented optical head combining IR and white light microscopy with metrology in the same optical path.

Applications:

- TSV formation ✔
- Temporary carrier process ✔
- Thinning process ✔
- Stacking process ✔

Benefits:

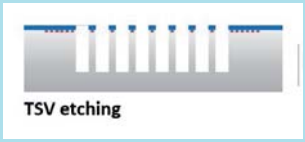
- Metrology and vision in the same optical path ✔
- Combination of IR & WL microscopy ✔
- Multiple sensor configurations ✔
- Address all 3D IC/TSV main process steps ✔

FOGALE nanotech

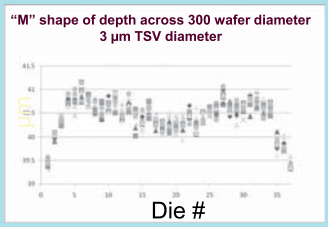
T-MAP DUAL 3D 300A
FULL Process control solution for 3D IC TSV

From TSV etching to TSV Reveal and die stacking: Inspection and metrology

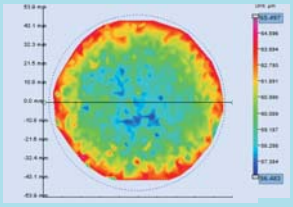
✓TSV Etching: CD and Depth



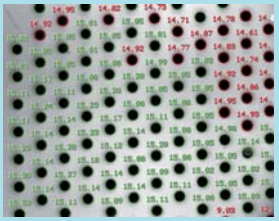
High A/R Depth measurement



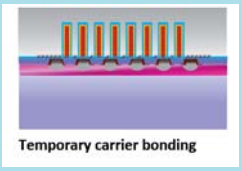
2µm TSV depth mapping



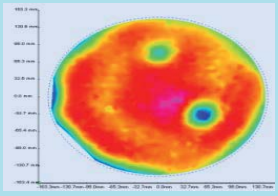
CD Measurement



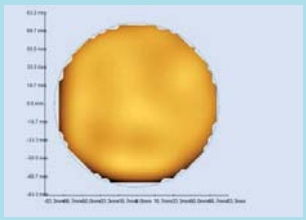
✓Temporary Bonding: Thickness, TTV, Glue Thickness uniformity, RST and defect/Void detection …



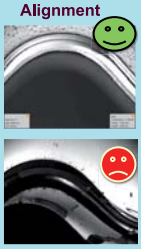
TTV Glue



TTV Si

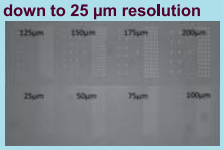


Alignment

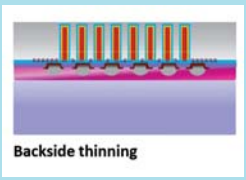


Interface micro inspection
- down to 1 µm resolution

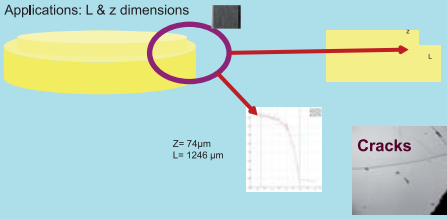
Interface macro inspection (full wafer)
- down to 25 µm resolution



✓Backside thinning: Edge trim, RST and roughness measurement, Cracks defect review

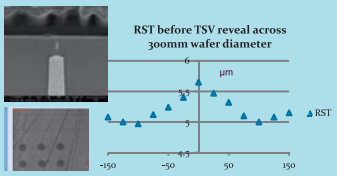


Applications: L & z dimensions



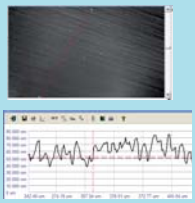
Edge inspection

Cracks

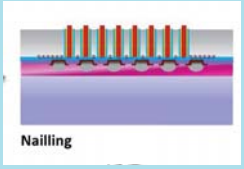


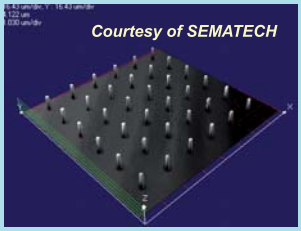
Influence of TSV depth uniformity + Wafer thinning

Backside Roughness

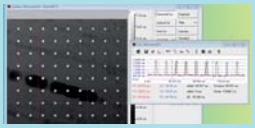


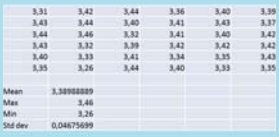
✓TSV reveal: Height and Co-planarity



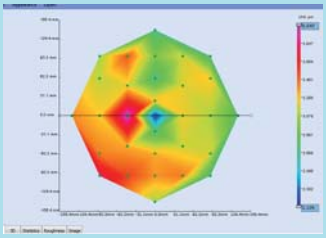


Height and co-planarity

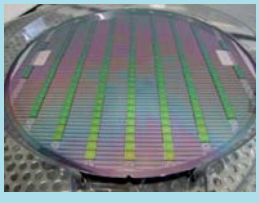




Pillar height uniformity within wafer

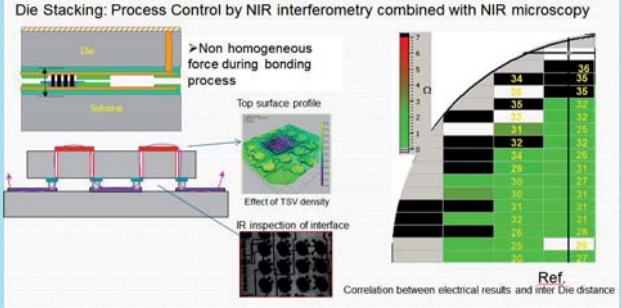


✓Stacking



SMARTSTACK Project: FOGALE, LETI,ST GEMALTO, SPTS

Die Stacking: Process Control by NIR interferometry combined with NIR microscopy



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