Key Substrate Processes

Additive for Copper Plating for Through-hole Filling

Thru-Cup EXP-01

- Electrolytic copper bath for Periodic Pulse Reverse
- Excellent filling performance for high aspect ratio through-hole
- Excellent metallurgical properties

2-step Plating (PPR + DC)

Through-hole Filling for Glass Panel

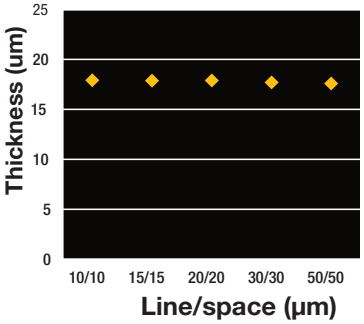
- Opening diameter: 100 µm
- Board thickness: 1000 µm
- Aspect ratio: 10:1
- Seed layer: MOSL + PEA V2
- 1st electrolytic copper: EXP-01 (PPR)
- 2nd electrolytic copper: ETV-14 (DC)

Electrolytic Copper RDL Plating

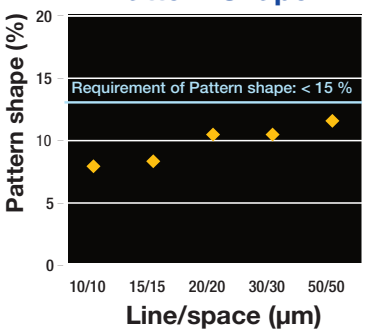
Epithas EHK-12

- Excellent thickness distribution for fine pattern plating
- Excellent filling performance for blind via holes
- All process additives' concentrations can be easily analyzed by CVS

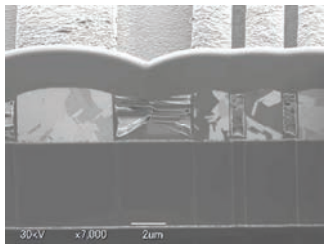
Thickness Distribution



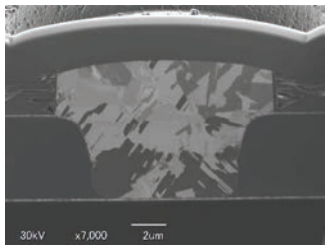
Pattern Shape



Pattern Plating on Fine Line



Minimum line/space: 1.6/1.4 µm after seed etching



Blind via hole: 20µm diameter 10 µm depth

Plating thickness: 3µm on the surface by 1 A/dm^2

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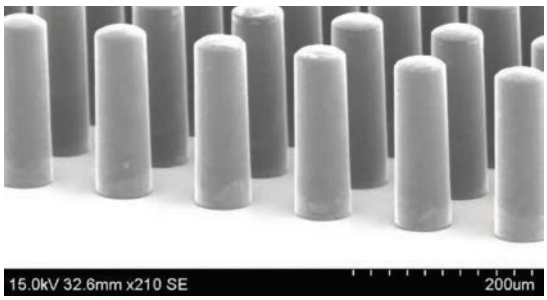
Electrolytic Copper Post Plating

Epithas EPT-H

- Excellent flat shaped post using high speed plating.
- Bath aging has minimal impact
- Plating solution is easily controlled
- All process additives' concentrations can be easily analyzed by CVS



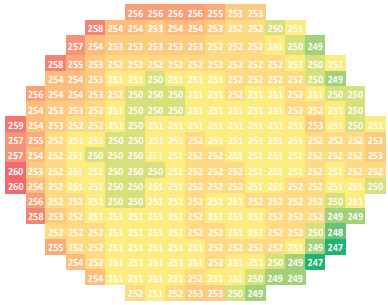
High Aspect Ratio Post Plating

- Current density: 9.3 A/dm2
- Post height target: 185 µm
- Plating time: 90 min
- Post diameter: 60 µm

Copper Post Plating for Wafers

- Wafer size: 300 µm
- Current density: 25 A/dm2
- Post height target: 250 µm
- Plating time: 45 min
- Post diameter: 200 µm

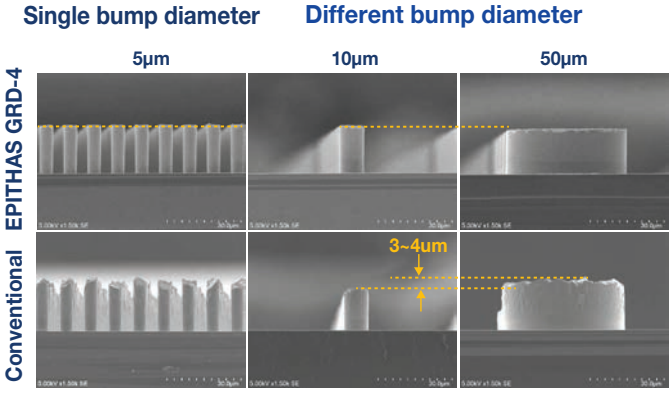
Total 100,000 posts
Post height uniformity
in Φ300 mm whole wafer



Sn-Ag Bump Forming

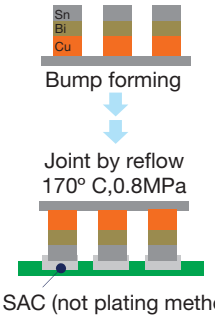
Epithas GRD-4

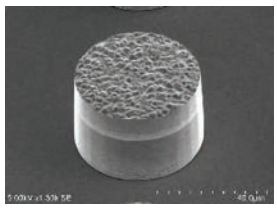
- Uniform Sn-Ag thickness with different diameters
- Smooth surface morphology



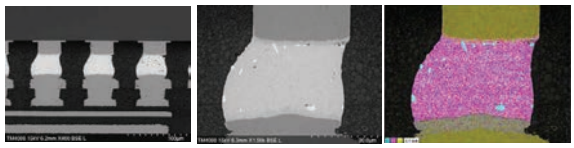
Sn-Bi Bump Forming for Low Temperature Soldering

- Solder joint at temperatures < 200° C





Cu/Bi/Sn thickness = 25µm / 3µm / 7µm
Bi/Sn = 25%/75%



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