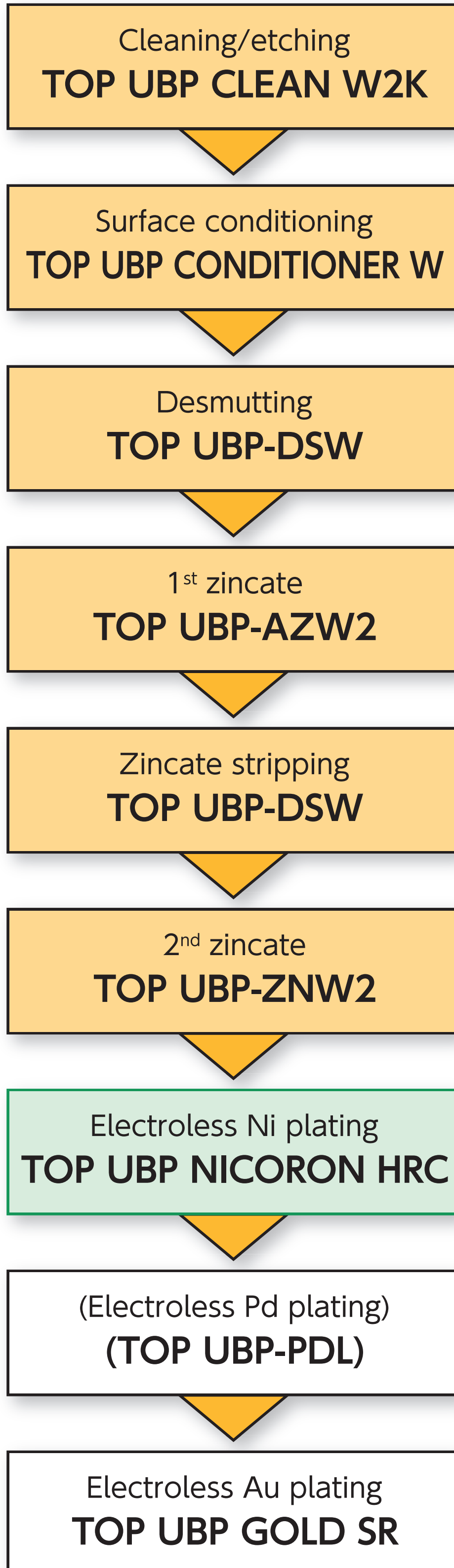
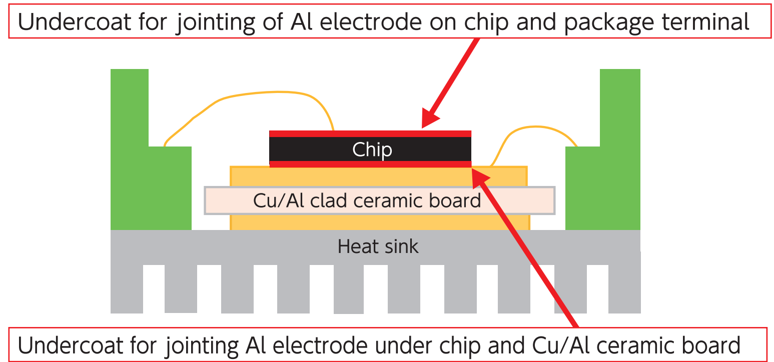
Under barrier metal formation process for Al electrode on wafer

TOP UBP PROCESS W

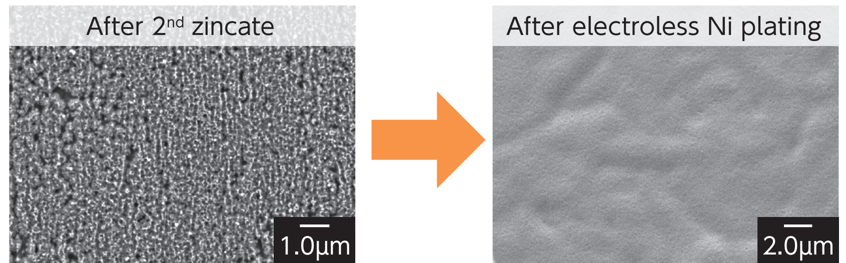
- Make zincate film finely, improve the smoothness of nickel film
- Prevent local corrosion and nickel spike in pre-treatment process for Al sputtering layer
- Electroless Ni plating: Prevent cracks even after heat treatment at 400 ℃
- High temperature reliability for silver sintered joint



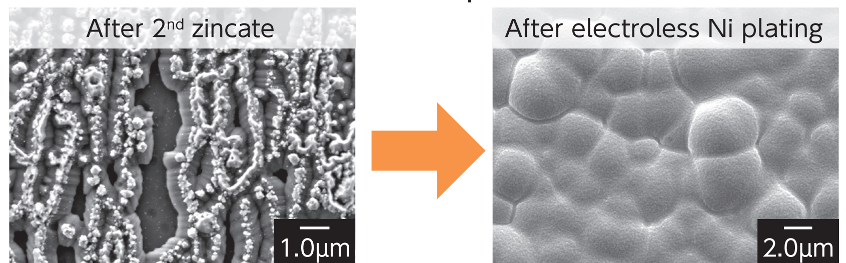


Fine, uniform film on Al electrodes

TOP UBP PROCESS W Surface SEM image

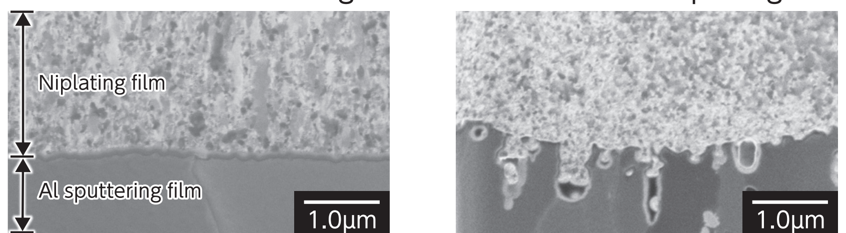


Conventional process



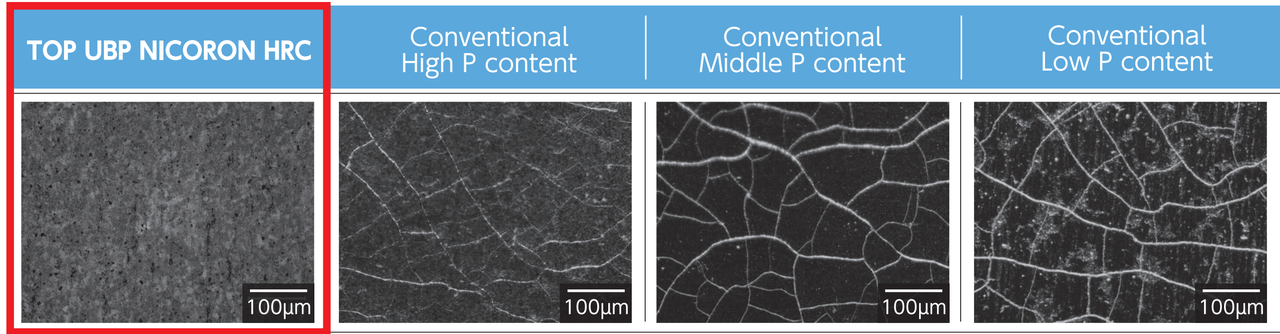
Prevent local corrosion of Al sputtering film

Cross-sectional SEM image after electroless nickel plating



TOP UBP PROCESS W   Conventional process

Electroless Ni plating film applicable to high temperature jointing



Heat treatment：400 ℃ 30 min

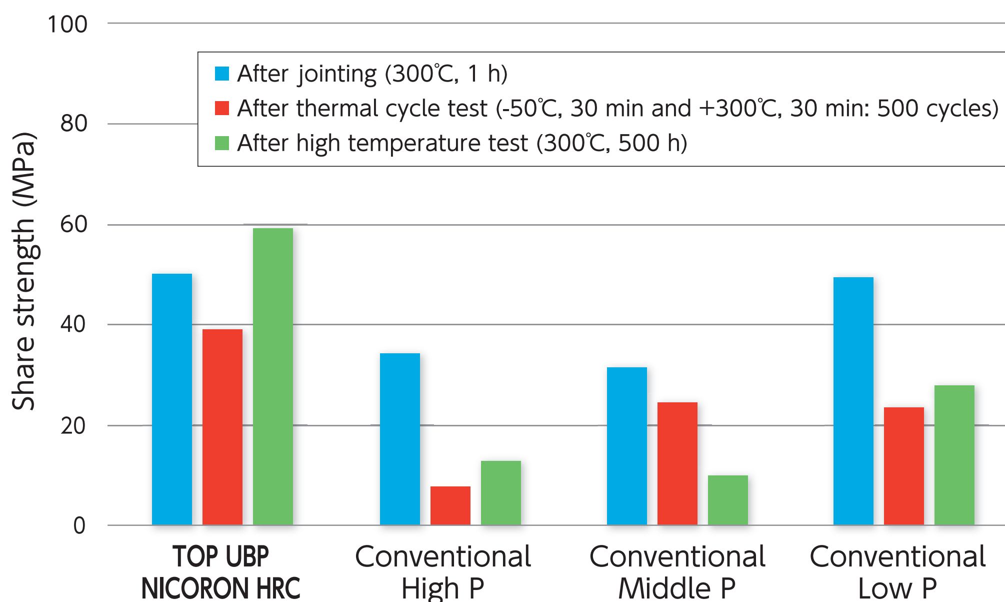
Indentation test by Erichsen tester (Ni thickness 3 μm, indentation width：0.5 mm)

Prevent cracks after 400 ℃ heat treatment

Electroless Ni plating film to endure high-temperature environment

Crack occurrence comparison of electroless Ni plating film

Electroless Ni plating film	Crack occurrence		
	After jointing	After thermal cycle	After high temperature test
TOP UBP NICORON HRC	**No**	**No**	**No**
Conventional, high P	No	Occur	Occur
Conventional, middle P	No	Occur	Occur
Conventional, low P	No	Slightly occur	Slightly occur



Share strength after silver sintered joint

Presented by SANKEN, Osaka University Flexible 3D JISSO Collaborative Research Institute
SiC Chip: Ti sputtering on SiC chip, and form Ag sputtering layer
Jointing condition：Electroless Ni plating (7μm thickness) on DBA substrate and sintering SiC chip on DBA substrate with Ag paste (Adding 1MPa pressure, 300℃, 1h)