



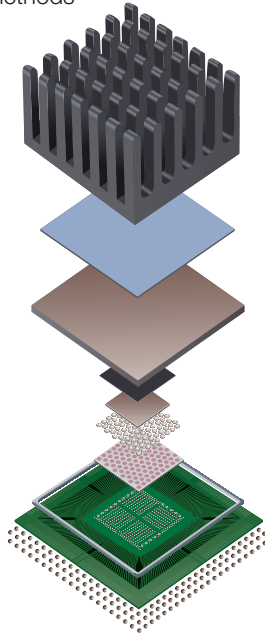
**Honeywell Materials  
for Flip Chip Metallization**

# Honeywell Materials for Flip Chip Metallization

## METALS FOR UNDERBUMP METALLURGY (UBM) AND WAFER BUMPING (WB)

### BENEFITS

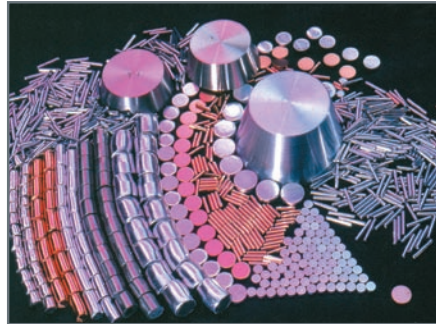
- Moderate to high purity
- Low alpha materials to prevent soft errors
- Available for most standard metallization methods



### OVERVIEW

Honeywell Electronic Materials supplies the metals needed for both the Underbump Metallurgy (UBM) and Wafer Bumping (WB) required to create the bumps on Flip Chips. UBM materials include Al, Ti, Ni, Ag, Au, Cu, NiV and TiW while WB materials include Sn, Pb, and low alpha Pb and Sn alloys. Supported deposition techniques include evaporation, plating and sputtering.

#### Evaporation

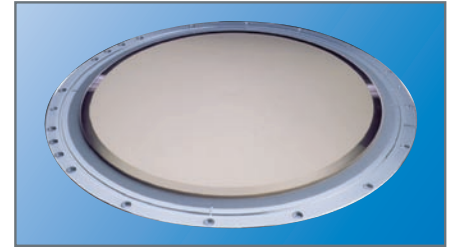


Evaporation is one of the primary methods used to apply both the UBM and WB for wafer bumping. Honeywell supplies all of the metals used for flip chip metallization as both slugs and supercharges.

#### Plating

Plating is gaining wider popularity for applying flip chip metals due to higher efficiency. Honeywell supplies Pb, Pb alloys, Sn and Sn alloys. All materials are available in various purities and alpha flux levels.

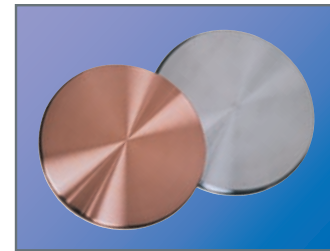
#### Sputtering



Sputtering is gaining wider acceptance for applying the UBM since it is easier to apply thin layers of alloys than via evaporation, particularly for large wafers. Honeywell is a leading supplier of sputtering targets for wafer fabrication and is your best source for UBM targets.

#### Bulk Materials

We supply low alpha solder alloys for customer conversion into solder paste and plating baths. Honeywell bulk materials are available in a wide variety of forms for ease of handling and dissolution.



### Flip Chip Metallization Materials Available from Honeywell

| METAL OR ALLOY   | PURITY                        | COMMON FORMS                                                   |
|------------------|-------------------------------|----------------------------------------------------------------|
| Al               | 49, 59, 59.5                  | Sputtering targets, evaporation slugs                          |
| Ag               | 49, 59                        | Evaporation slugs                                              |
| Cu               | 49, 59, 59.5                  | Evaporation slugs, sputtering targets, anodes                  |
| Cu + 500 ppm P   | 39, 49, 59                    | Anodes                                                         |
| Ni               | 39.7, 49                      | Evaporation slugs                                              |
| W10Ti            | 49.5                          | Sputtering targets                                             |
| Sn               | 49                            | Evaporation slugs, anodes                                      |
| Pb               | 49                            | Evaporation slugs                                              |
| Sn37Pb           | 49                            | Anodes, slab for solder paste manufacturing                    |
| Pb5Sn            | 49                            | Anodes, slab for solder paste manufacturing                    |
| Low alpha solder | <0.01 cts/cm <sup>2</sup> /hr | Anodes, evaporation slugs, slab for solder paste manufacturing |



RESPONSIBLE CARE  
OUR COMMITMENT TO SUSTAINABILITY

#### Honeywell Electronic Materials

USA: 1-509-252-2102

China: 86-21-28942481

Germany: 49-5137-999-9199

Japan: 81-3-6730-7092

Korea: 82-2-3483-5076

Singapore: 65-6580-3593

Taiwan: 886-3-6580300 ext.312

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