



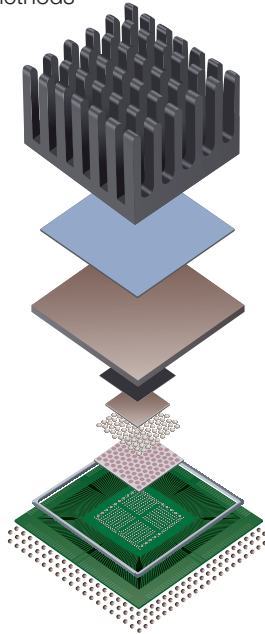
**Honeywell Materials
for Flip Chip Metallization**

Honeywell Materials for Flip Chip Metallization

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

BENEFITS

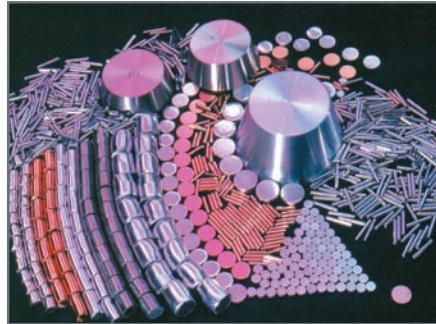
- Moderate to high purity
- Low alpha materials to prevent soft errors
- Available for most standard metallization methods



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

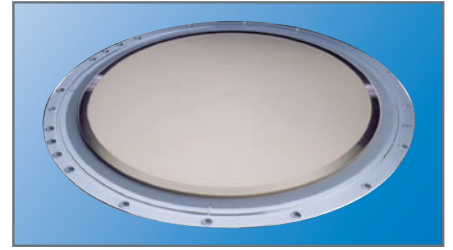


Evaporation is one of the primary methods used to apply both the UBM and WB for wafer bumping. Honeywell supplies all of the metals used for flip chip metallization as both slugs and supercharges.

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.

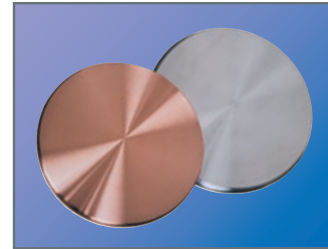
Sputtering



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 ² /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

www.honeywell.com/sm/em

Although all statements and information contained herein are believed to be accurate and reliable, they are presented without guarantee or warranty of any kind, express or implied. Information provided herein does not relieve the user from the responsibility of carrying out its own tests and experiments, and the user assumes all risks and liability for use of the information and results obtained. Statements or suggestions concerning the use of materials and processes are made without representation or warranty that any such use is free of patent infringement and are not recommendations to infringe any patent. The user should not assume that all toxicity data and safety measures are indicated herein or that other measures may not be required. PB0251011Rev12
©2011 Honeywell International Inc.

Honeywell