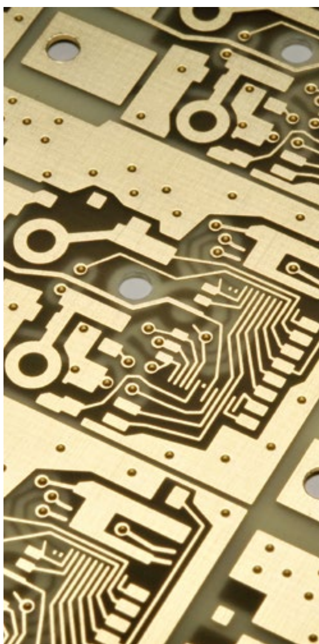
Version: 30 April 2019

umicore
Electroplating

ISIG PROCESS

IMMERSION SILVER AND IMMERSION GOLD PLATING

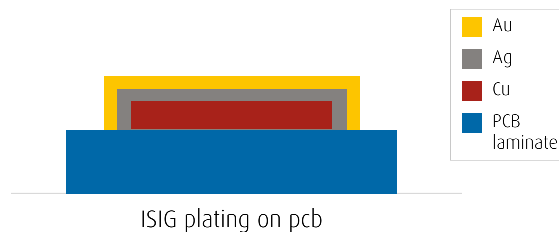


Immersion Silver and Semi-Autocatalytic Gold Plating

Umicores´ silver and gold plating process (ISIG) provides customers a high performance nickel-free coating which meets most of the common assembly requirements like multiple solderability and bondability with aluminium and gold wire even by existing thermal ageing stress before assembly.

Due to its outstanding film characteristics ISIG deposition is very well suited to withstand the higher requirements of PCB designer concerning fine pattern ability and high frequency signal transfer in combination with complying newest RoHs and WEEE regulations.

ISIG as Final Finish



ISIG plating on pcb

Advantages

- Nickel free coating
- High conductivity
- Thin and very uniform electroless desposition
- Suitable for (ultra) fine pitch layouts
- Ductile final finish compatible for flex PCB
- Dense and homogenous gold protection layer up to 0.3 µm feasible
- Reliable Pb-free and Sn/Pb soldering
- Excellent Al- and Au-wire bondability

Applications

- Flexboard PCB (FPC)
- Medical technology
- High frequency technology

ISIG PROCESS

IMMERSION SILVER AND IMMERSION GOLD PLATING

TECHNICAL SPECIFICATIONS IMMERSION SILVER PLATING

Electrolyte characteristics Presa® RGA-14	
Electrolyte type	Displacement process
Metal content	1.0 (0.8 - 1.2) g/l Ag
pH value	acidic
Operating temperature	50 °C
Deposition rate	approx. 0.2 µm/min

Coating characteristics	
Coating composition	Fine silver
Purity	99.9 wt%
Colour of film	Silver
Recommended thickness	0.1 - 0.4 µm

TECHNICAL SPECIFICATIONS IMMERSION (SEMI AUTOCATALYTIC) GOLD PLATING

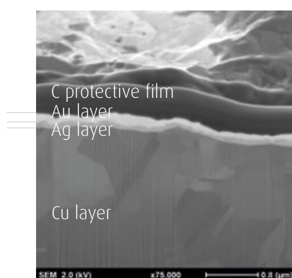
Electrolyte characteristics Gobright® TWX-40	
Electrolyte type	Semi autocatalytic
Metal content	1.2 (1.0 - 1.4) g/l Au
pH value	7.1 (6.9 - 7.4)
Operating temperature	78 (76 - 84) °C
Deposition rate	0.12 µm/15 min at 78°C

Coating characteristics	
Coating composition	Fine gold
Purity	99.9 wt %
Colour of film	Yellow
Recommended thickness	0.05 - 0.2 µm

ISIG PROCESS

IMMERSION SILVER AND IMMERSION GOLD PLATING

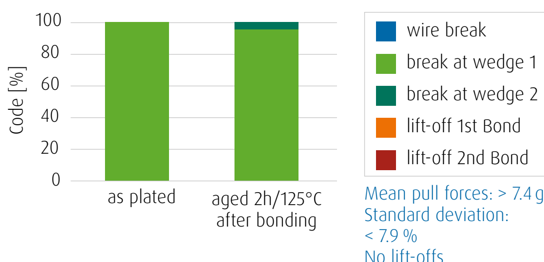
Cross-Section Observation by FIB of ISIG Film



Thin and uniform Au/Ag deposition

Aluminium Wire Pull Test Results, AlSi1 25 µm

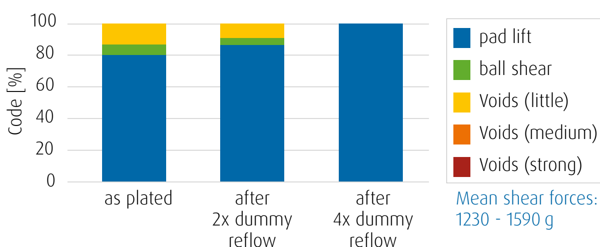
ISIG PCB, plated with 0.18 µm Ag and 0.15 µm Au



Mean pull forces: > 7.4 g
Standard deviation: < 7.9 %
No lift-offs

BGA Solder Ball Shear Results

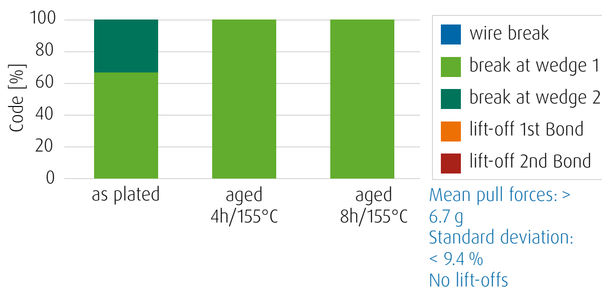
(ball size 0.76 mm, 30 mil, SAC solder)
ISIG PCB, plated with 0.18 µm Ag and 0.15 µm Au



Mean shear forces: 1230 - 1590 g

Gold Wire Pull Test Results, Au Heraeus HD2 25 µm

ISIG PCB, plated with 0.18 µm Ag and 0.15 µm Au



Mean pull forces: > 6.7 g
Standard deviation: < 9.4 %
No lift-offs

YOUR CONTACT

Do you have a specific question or would you like a no-obligation quote calculation?
Our specialist will be happy to help you with any technical questions you might have.

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