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umicore Electroplating

DIG PROCESS

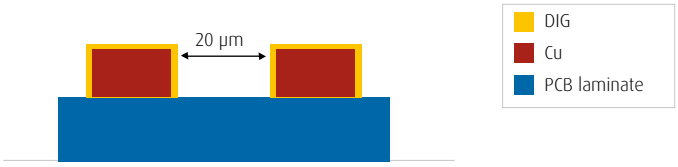
DIRECT IMMERSION GOLD PLATING

Plating of Direct Immersion Gold

Ever increasing electric components density and high frequencies of signal transmission require new concepts of final finishes in PCB manufacturing, too. By direct gold plating on copper (DIG) beside ISIG and EPIG a further process has been provided, which is free from nickel and has a high HF performance.

Due to its outstanding film characteristics DIG deposits are very well suited to withstand the higher requirements of PCB designers concerning fine pattern ability and high performance regarding soldering and wire bonding.

DIG as Final Finish



DIG plating on PCB

Advantages

- Nickel free coating
- Deposits with high HF performance
- Suitable for (ultra) fine pitch layouts
- Ductile film compatible for flex PCB applications
- Dense and homogenous gold protection layer up to 0.3 µm feasible
- High solderjoint reliability (SJR) due to low void formation
- Excellent Al-, Au-, Cu-(Pd coated) and Ag-wire bondability
- Low plating cost due to few process steps

Applications

- Flexboard PCB (FPC)
- Multi-functional assembly
- Fine pattern PCB design

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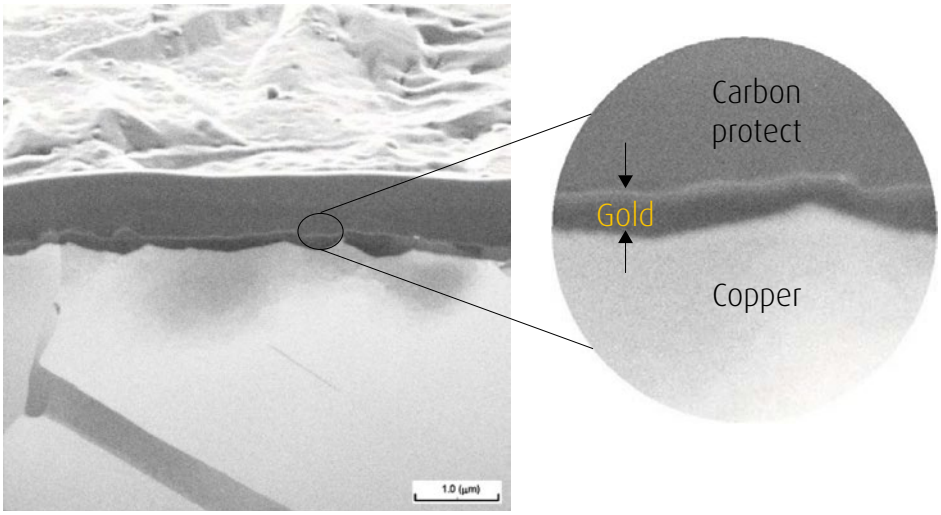
TECHNICAL SPECIFICATIONS (SEMI AUTOCATALYTIC) GOLD PLATING, DIRECTLY ON COPPER

Electrolyte characteristics Gobright® TCU-38	
Electrolyte type	Semi autocatalytic
Metal content	1.2 (1.0 - 1.4) g/l Au
pH value	7.2 (7.0 - 7.4)
Operating temperature	80 (78 - 82) °C
Deposition rate	0.15 µm / 20 min at 80 °C

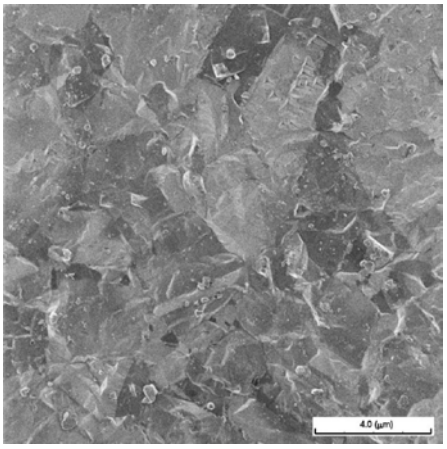
Coating characteristics	
Coating composition	Fine gold
Purity	99.9 wt %
Colour of film	Yellow
Recommended thickness	0.1 - 0.3 µm

When the assembly process consists of a simple soldering only, a reduced gold thickness of 0.1 - 0.2 µm is sufficient in this case.

Cross-Section Observation by FIB of DIG Film



SEM Surface Image of DIG Film



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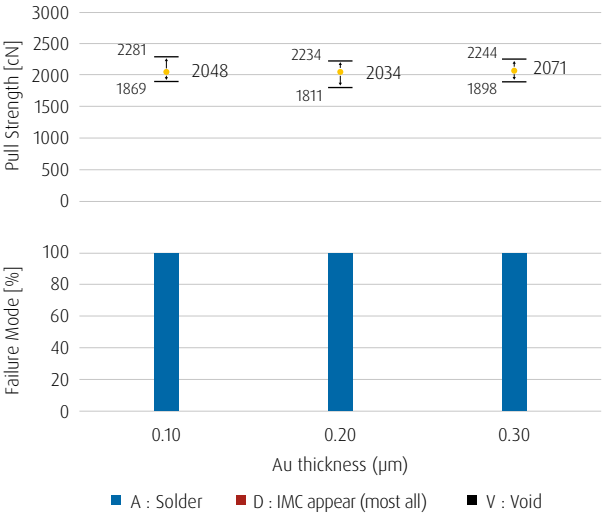
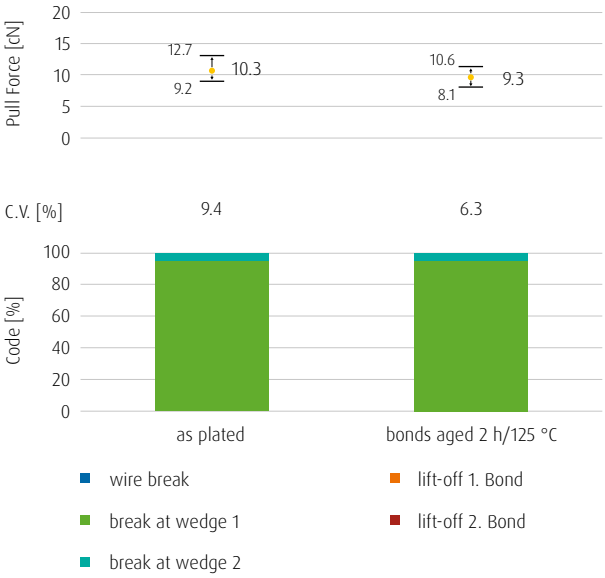
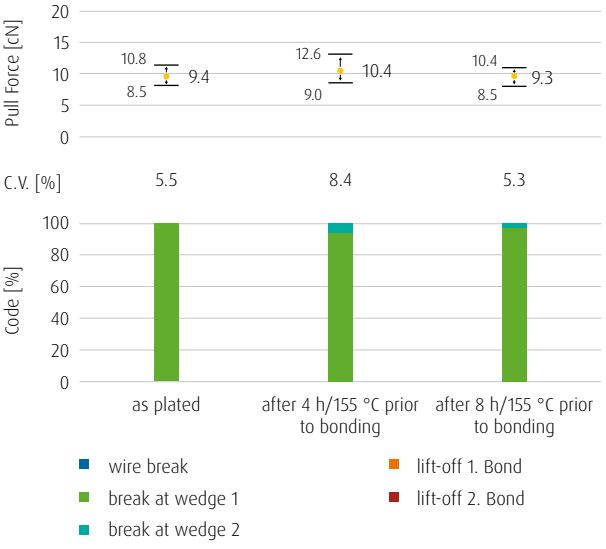
Ball pull results for SJR (0.6 mm ball, SAC 305, after 4 x dummy reflow)



Aluminium Wire Pull Test Results (0.23 µm Au; 25 µm AlSi1 wire)



Gold Wire Pull Test Results (0.23 µm Au; 25 µm Au wire)



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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