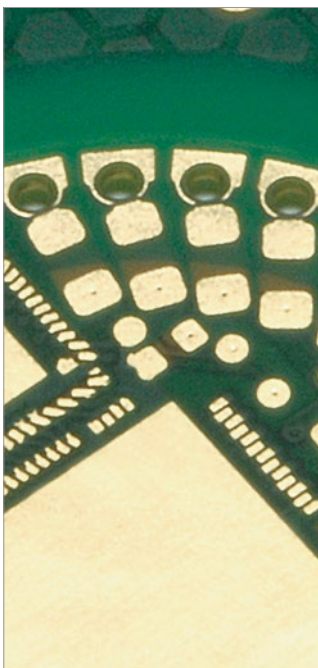


# EPIG PROCESS

## ELECTROLESS PALLADIUM AND IMMERSION GOLD PLATING

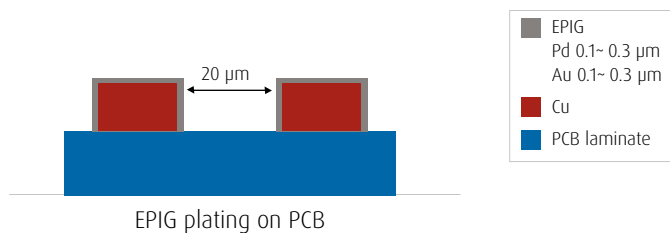


### Electroless Palladium and Semi-Autocatalytic Gold Plating

Umicore's palladium and gold plating process (EPIG) 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 EPIG deposition is very well suited to withstand the higher requirements of PCB designer concerning fine pattern ability and high performance regarding soldering and bonding process signal transfer in combination with complying newest RoHs and WEEE regulations.

### EPIG as Final Finish



### Advantages

- Nickel free coating
- Thin and very uniform electroless deposition
- 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

### Applications

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

# EPIG PROCESS

## ELECTROLESS PALLADIUM AND IMMERSION GOLD PLATING

### TECHNICAL SPECIFICATIONS ELECTROLESS PALLADIUM PLATING

Electrolyte characteristics Altarea® TPG-39		Coating characteristics	
Electrolyte type	Autocatalytic process	Coating composition	Palladium-Phosphorus
Metal content	0.6 (0.45 - 0.75) g/l Pd	Colour of film	Grey
pH value	7.2 (7.0 - 7.5)	Recommended thickness	0.1 - 0.3 µm
Operating temperature	60 °C		
Deposition rate	0.6 µm / 10 min		

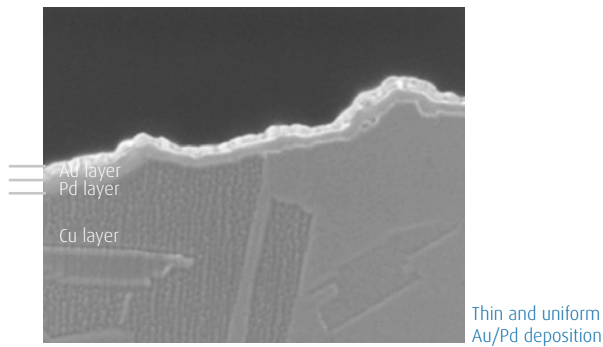
### TECHNICAL SPECIFICATIONS (SEMI AUTOCATALYTIC) GOLD PLATING

Electrolyte characteristics Gobright® TWX-40		Coating characteristics	
Electrolyte type	Semi autocatalytic	Coating composition	Fine gold
Metal content	1.2 (1.0 - 1.4) g/l Au	Purity	99.9 wt %
pH value	7.1 (6.9 - 7.4)	Colour of film	Yellow
Operating temperature	78 (76 - 84) °C	Recommended thickness	0.05 - 0.2 µm
Deposition rate	0.12 µm/15 min at 78°C		

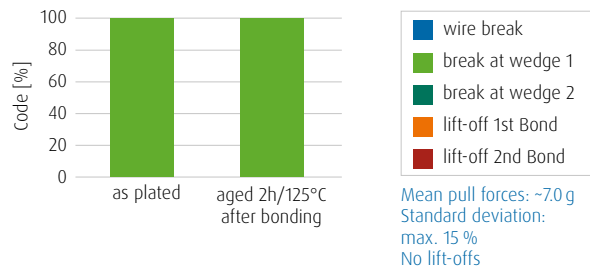
# EPIG PROCESS

## ELECTROLESS PALLADIUM AND IMMERSION GOLD PLATING

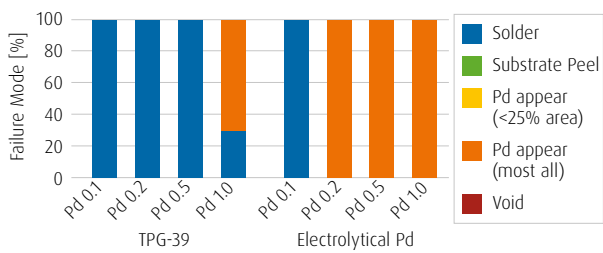
### Cross-Section Observation by FIB of EPIG Film



### Aluminium Wire Pull Test Results

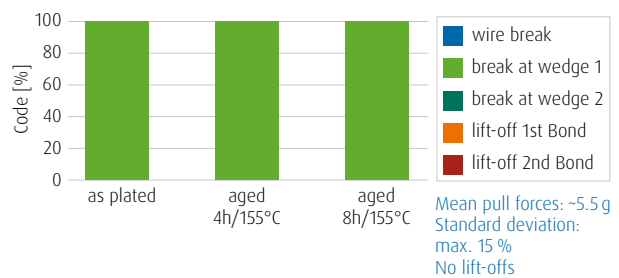


### Comparison of EPIG and Pd Film Type for SJR



EPIG used Pd-P had excellent SJR when Pd thickness was less than 0.5μm. On the other hand, EPIG used pure Pd had poor SJR when Pd thickness was more than 0.2μm.

### Gold Wire Pull Test Results



## 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.



Markus Legeler  
Manager Sales International

Mail: markus.legeler@eu.umicore.com  
Phone: +49 (0) 7171 607 - 204

