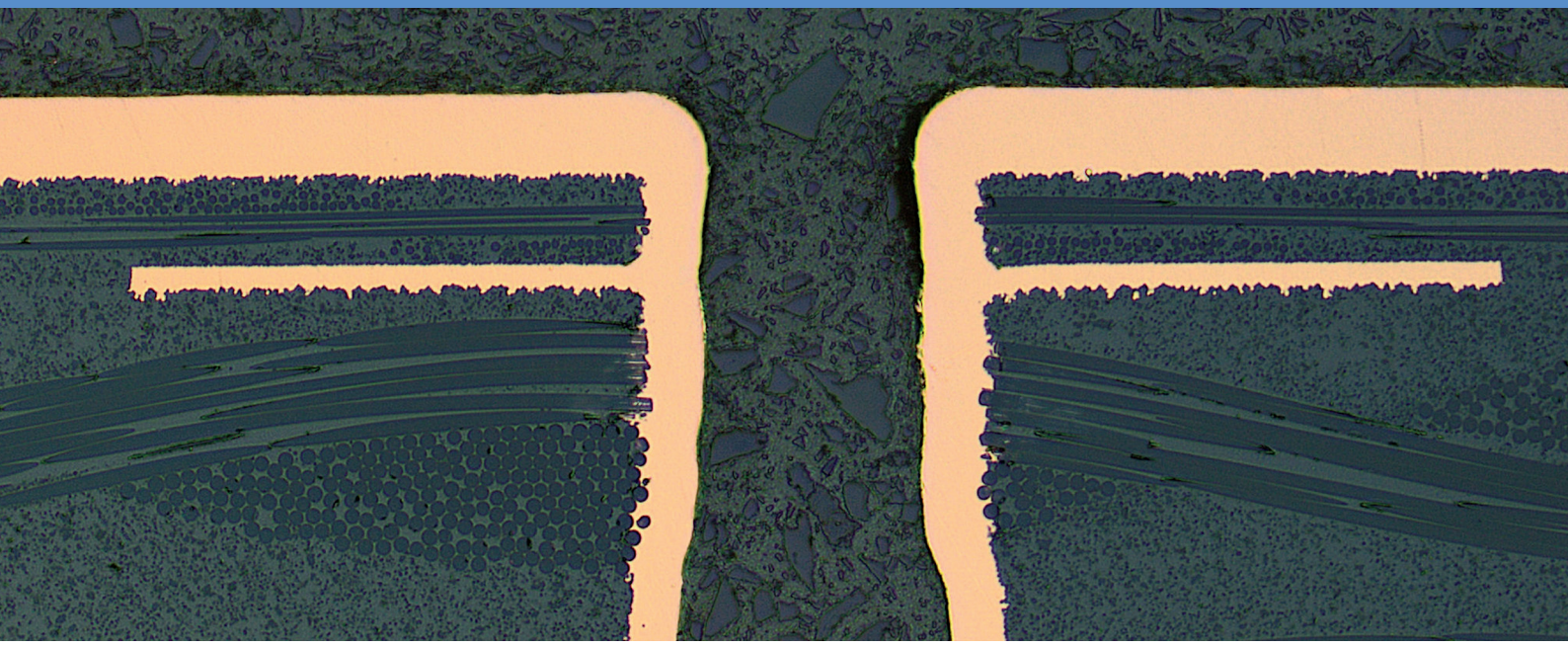
Cupracid® TP3

Conformal copper plating

Electronics

Panel and pattern plating

atotech.com



Advanced solution for vertical hoist type systems

up to

12

solder shock cycles without cracks

Background

Conformal copper plating market is still dominated by use of convectional hoist type equipment using soluble anodes. Driving forces for high end technology can be summarized as “smaller, faster, cheaper”, so also this reliable and proven technology nowadays faces new requirements: high layer count panels with increasing aspect ratio, improved surface distribution in panel and also pattern plating, high reliability for critical applications and cost reduction just to name a few. All this needs to be fulfilled in conventional hoist type equipment. Cupracid® TP3 was developed to fulfill the requirements and targets to be come the new benchmark for DC technology.

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New benchmark for vertical DC plating

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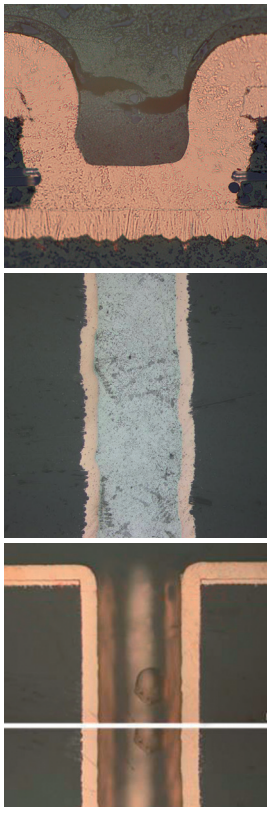


Figure 1:
BMV with >80% throwing power at 2.2 A/dm²
Figure 2:
Excellent compatibility with direct plating
Figure 3:
80% throwing power and no corner flattening at 2.5 A/dm² for aspect ratio 8:1

Importance of throwing power and corner flattening

For PCB plating throwing power describes the ratio between copper plated on the panel surface to copper plated in the hole. Higher throwing power means a reduction in costs and increased productivity due to less plated copper on the surface. It also is a pre-requisite for excellent physical properties like conductivity, thermo stress resistance and ductility/tensile stress. Corner flattening describes that the plating thickness at the corners of the holes is lower than at the near surface and hole area. Strong corner flattening induces “corner cracks” in solder shock or thermal cycles.

Stable anode film on soluble anodes

During copper plating with soluble anodes a dense, adhering copper oxide layer on all copper anode surfaces is created. This anode layer significantly reduces and stabilises the additive consumption. If the anode film falls off, this could lead to unstable production conditions, higher additive consumption and surface defects.

Convincing processing advantages

Cupracid® TP3 provides excellent throwing power and minimum corner flattening over high working range. By this outstanding throwing power even at high current densities less copper needs to be plated on the surface, enabling higher productivity for conventional hoist type equipment.
The plated deposits with Cupracid® TP3 exhibit uniform crystal structure resulting in excellent ductility and tensile stress. By that superior reliability results can be achieved: standard solder shock test (in accordance to IPC-6012c Class 3/A) passed up to 12 cycles without cracks.
The anode film created by use of Cupracid® TP3 is very robust and therefore ensures stable production conditions and additive consumption.

Features and benefits

- Electrolytic copper plating process for conventional DC equipment
- Outstanding throwing power with high applied current densities
- High purity copper deposit with low internal stress for highest reliability
- Excellent physical properties ductility and tensile strength
- Compatible with all commonly used direct metallization processes
- Wide additive working range and fully controllable with CVS analysis for easy process control