# Spherolyte® Cu UF 3

## Next generation RDL plating

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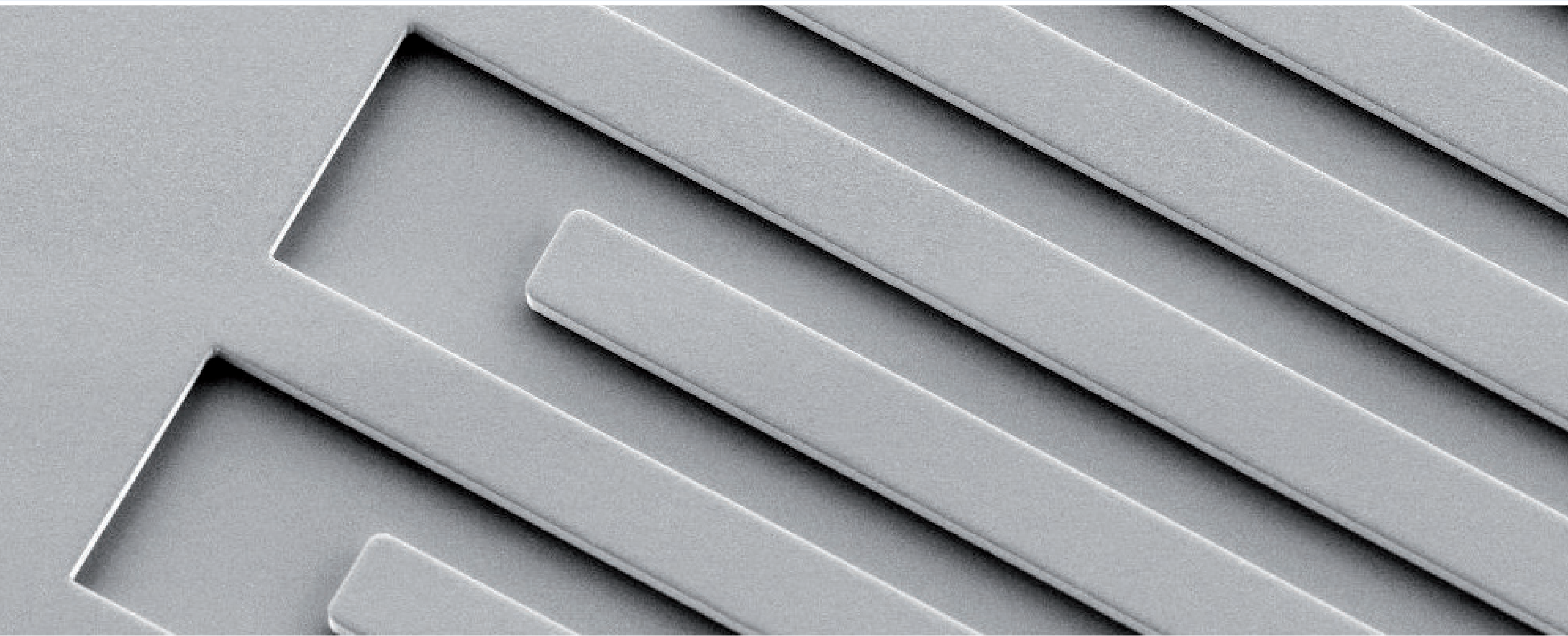

## Cu RDL process for fine line plating and microvia filling

< 10 ppm

lowest impurity incorporation as measured by D-SIMS

29%

ductility

### Best in class reliability performance for next generation RDL

Next generation packaging technologies such as heterogeneous integration involves the assembly of separately manufactured components and requires the combination of a broad variety of different materials with different characteristics.

Redistribution layers consisting of copper conductor lines and organic dielectric are key components of a variety of technologies to connect the various functional components. In order to improve the reliability of such assembly, the mechanical properties of the individual materials need to be optimized. In particular, fan out wafer level packaging with decreasing lines and spaces requires a pure copper deposition to achieve a high reliability.

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# Spherolyte® Cu UF 3 for next generation RDL and microvia plating

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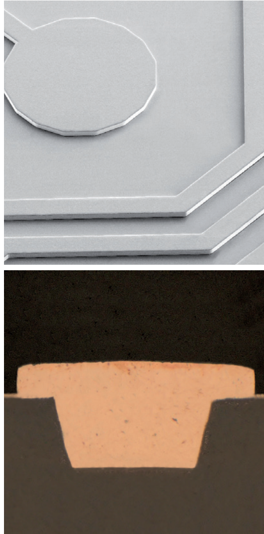

**Figure 1:**
Plating fine lines and Cu pads
**Figure 2:**
Microvia filling CD ≤ 20µm

## High purity and ductility

In a package, thermal expansion is mainly dominated by die and mold, which creates a high strain on thin Cu lines. In order to compensate this high strain, a high material ductility is beneficial to allow a significant plastic deformation before rupture. Investigation shows that a high Cu purity leads to such an improved ductility. Our Spherolyte® Cu UF 3 process use of high purity chemistries significantly reduces the level of additive incorporation and minimizes the risk of microvoid formations that amass after thermal cycle testing and may lead to failures or breakages in the Cu lines.

## Via filling capability

Spherolyte® Cu UF 3 is a high purity ECD process that enables stable and optimal mechanical properties within a wide process window. The three additive system is designed for plating sub 5 µm lines and large Cu pads, while simultaneously enabling via filling. The combination of both features exactly addresses the future requirements of FOWLP technology.

## Features and benefits

- Single process for both fine line plating and microvia filling
- Low incorporation level of additives, enabling high purity Cu deposit
- Low internal stress: 20 MPa
- High tensile strength: 29,4 kN/cm$^2$
- Reduction in fine line cracking after thermal treatment

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