AquiVia fill sets new standards for metallization process Of the most advanced through-silicon vias

I-Micronews

Alchimer S.A., a leading provider of technology for the deposition of nanometric films used in both semiconductor interconnects and 3D through-silicon vias (TSV), today announced a groundbreaking advance for filling narrow, high-aspect-ratio TSVs while significantly reducing the need for chemical components in the metallization process.

The new AquiVia Fill process is an innovative, high-purity copper-plating chemistry that was specially developed to fill narrow TSVs with diameters of less than five microns and aspect ratios greater than 10:1. Reduced via diameter frees up substantial space on stacked chips, and improves signal integrity, where traditional manufacturing technologies have struggled to provide quality filling at an affordable cost.

“AquiVia Fill overcomes processing limitations in the current marketplace; lack of fill technology has been an obstacle to chip and system designers who are trying to pack as much power as possible into next-generation portable systems,” said **Dr. Claudio Truzzi**, Alchimer’s chief technology officer. *“This new approach to via filling complements Alchimer’s AquiVia XS seedless TSV films process, which deposits insulation and barrier layers in high aspect ratio TSVs prior to filling.”*

The combination of AquiVia XS and AquiVia Fill also extends designers’ and chipmakers’ ability to shorten the metallization process, and slashes overall cost of ownership compared to traditional electroplating metallization processes.
In contrast with current solutions based on strongly acidic, complex chemistries, AquiVia Fill is a mild basic solution that does not attack or degrade the underlying barrier or seed layer. It eliminates the need to electrically polarize the cathode before the introduction of the wafer. This procedure, called “hot entry”, has historically been introduced to limit the acidic attack of the solution, but it seriously degrades the metallic films and is difficult to control.

In another distinct improvement over current solutions, AquiVia Fill contains no chlorine (Cl) components. Cl must be added to acidic solutions to boost the effect of accelerator and suppressor additives. As an added benefit, AquiVia Fill does not form CuCl crust on the anode, eliminating the risk of having crust fragments detach and deposit onto the wafer. This risk is so high in legacy solutions that a filtering membrane must be introduced between the wafer and the anode, significantly adding to the cost of the deposition equipment.

“The most distinct benefit of AquiVia Fill probably is its extremely low number of added components, improving the purity level of the plated copper and drastically

reducing the risk of via pull-up during subsequent thermal cycles," **Truzzi** said. *"This is typically due to previously deposited components bubbling up to the TSV's exposed surface."*

Alchimer will start sampling AquiVia Fill with select customers by July 1.
About Alchimer S.A.
Alchimer develops and markets innovative chemical formulations, processes and IP for the deposition of nanometric films used in semiconductor interconnects and 3D TSVs (through-silicon vias), as well as other applications in the electronics value chain. The company's breakthrough technology, Electrografting (eG™), is an electrochemical-based process that enables the growth of very thin coatings, of various types, on both conducting and semiconducting surfaces. Based in Massy, France, Alchimer is a spin-off from the Commissariat à l'Energie Atomique (CEA). Founded in 2001, it won the First National Award for the Creation of High Tech Companies from the French Minister of Research and Industry and is a Red Herring Top 100 European Company.

SOURCE [1]

Source URL (retrieved on *08/20/2014 - 8:40am*):
http://www.mdtmag.com/news/2010/06/aquivia-fill-sets-new-standards-metallization-process-most-advanced-through-silicon-vias?qt-most_popular=0

Links:
[1] http://www.i-micronews.com/lectureArticle.asp?id=5019