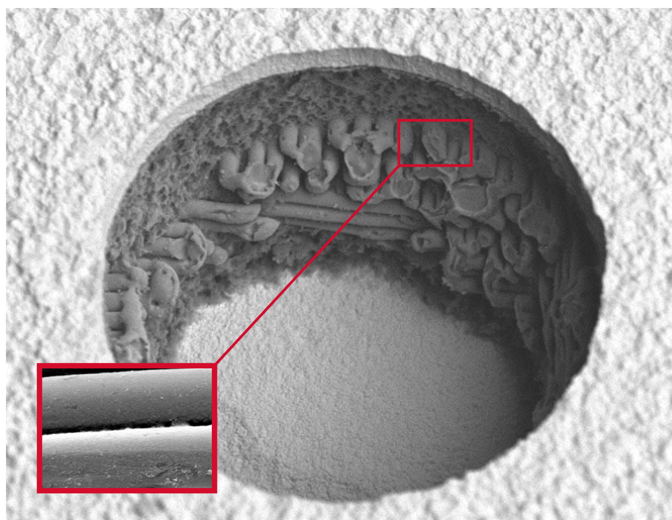
Eclipse LE

Low Etch Carbon-Based Direct Metallization System

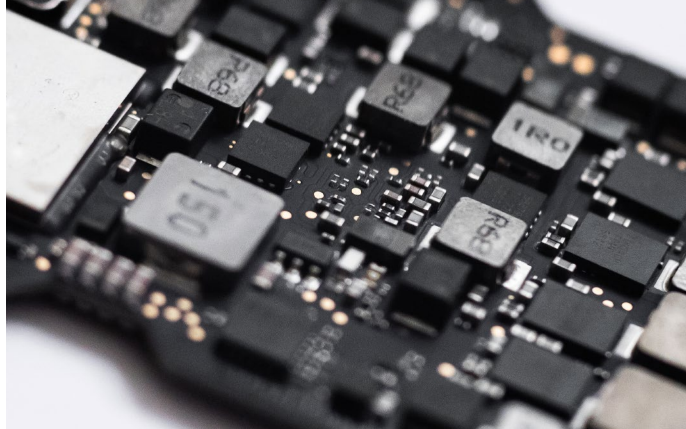
Low Etch Direct Metallization: High Yield mSAP.

Eclipse LE is the choice of fabricators worldwide that are looking to bring the reliable and environmentally responsible direct metallization technology into the production of high-density interconnects for mobile designs.

Manufacturers have increasingly adopted the modified Semi-Additive Process (mSAP) to create higher density circuitry for flagship mobile designs. The equipment and chemical upgrades of Eclipse LE now allow the exceptional reliability of direct metallization processing used worldwide on conventional HDI to be adapted to this new high technology manufacturing. With minimal etching and pristine copper micro via target pads, Eclipse LE allows for a higher quality manufacturing process with fewer additive copper steps and a leaner copper etch budget.



Laser drilled micro via (Inset: Eclipse LE conductive residue selective coating of nonmetallic surfaces only)



KEY FEATURES

- Chemical and equipment upgrades to Eclipse direct metallization, enabling mSAP
- Carbon coating and precise etching removal for clean copper target pads with activation on inert materials
- Eliminates multiple additive copper plating steps and enables direct electroplating to micro via target pads
- Protects copper etch budget for thin mSAP substrate foils while improving overall quality
- Equipment and chemical upgrade to existing direct metallization processes
- Environmentally friendly, palladium free activation
- Compatible with a wide range of board materials

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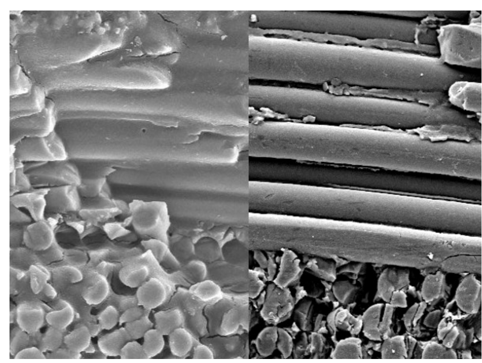
The Most Advanced Carbon Direct Metallization: Now Upgraded

For more than a decade, the Eclipse direct metallization has provided a highly reliable and environmentally friendly alternative to electroless copper and other primary metallization solutions. Completely upgraded from chemicals to equipment, Eclipse LE can now achieve the performance required to manufacture today's high-density mobile board boards built with modified Semi-Additive Processing. Compared to low build electroless copper and flash plate, the high-density interconnects created with Eclipse LE have fewer layers of additive copper. The low etch technology of Eclipse LE allows it to completely clean the carbon activation from micro via target pad copper surfaces. These benefits allow for more precise manufacturing, tighter tolerances, better trace morphology and improved process yields.



Left: Eclipse carbon coating on via wall before low etch processing.
Right: Low etch technology allows for precise removal of coating while maintaining activity.

Extensive Micro Via Reliability Data

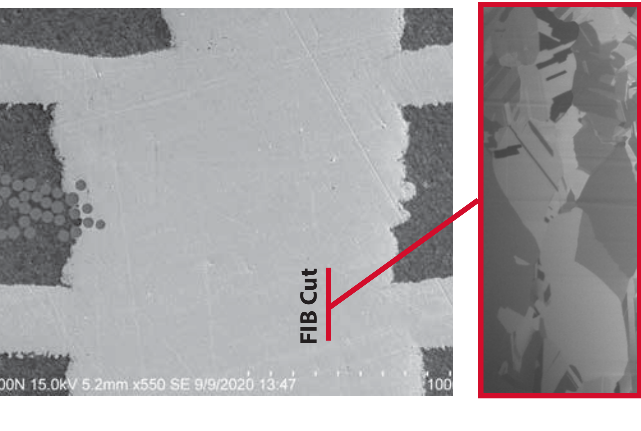
Micro Via IST Testing Results

Statistic	P2%	Cycles	S2%	Result
Ave	1.7	1,000	1.96	Pass
Min	1.9	1,000	1.97	Pass
Max	1.5	1,000	1.95	Pass
STDEV	0.28	0	0.01	Pass

Solder Shock Testing Results

Test Methodology	Qualification	Example Photo
Through Hole Solder Shock 10x, 288°C	100% Pass	
Microvia Solder Shock 10x, 288°C	100% Pass	

FIB-SEM Grain Structure at Target Pad Interface



Eclipse LE technology enables modified Semi-Additive Processing of high density innerlayers without electroless copper or flash plating layers. Compared to the standard process originally utilized for mSAP, this revolutionary process upgrade results in just one copper interface at the critically important micro via target pad copper surface.

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