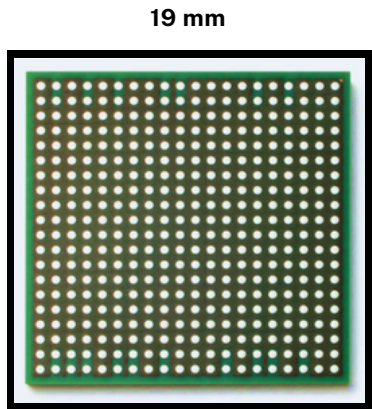
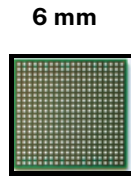


# A-SAP™ Averatek Semi-Additive Process

Dramatic size and weight reduction over current state-of-the-art with 15micron (.6mil) trace and space

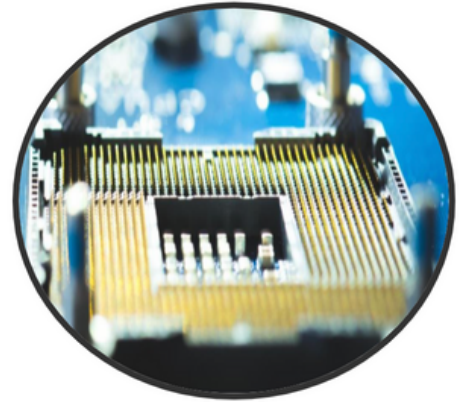


**Standard PCB**  
0.8mm pitch - 20x20 grid  
3 routing layers - L/S 3mil/3mil



**A-SAP™ PCB**  
0.3mm pitch - 20x20 grid  
3 routing layers - L/S 1mil/1mil

10X Area Reduction  
With Same Number Of Layers



## ULTRA HIGH-DENSITY

- **Improves Reliability:** reduced layer count, micro vias and lamination cycles.
- **Improved Signal Integrity:** aspect ratios greater than 1:1 for metal traces.

## HIGH PERFORMANCE PCBS

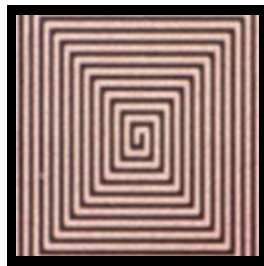
- **Improved RF Performance:** over traditional subtractive-etch processes.

## PACKAGE SUBSTRATES & INTERPOSERS

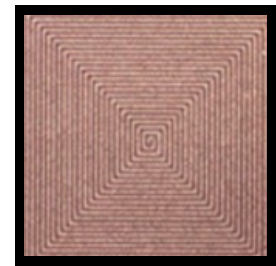
- **Reduced Costs:** especially for complex, high-performance boards.
- **Biocompatibility:** capability for utilization of gold as conductive metal.



Capability in USA Today  
75 microns



mSAP Capability Today  
25 microns



**AVERATEK** Capability Today  
15 microns or better

### REDUCTION IN:

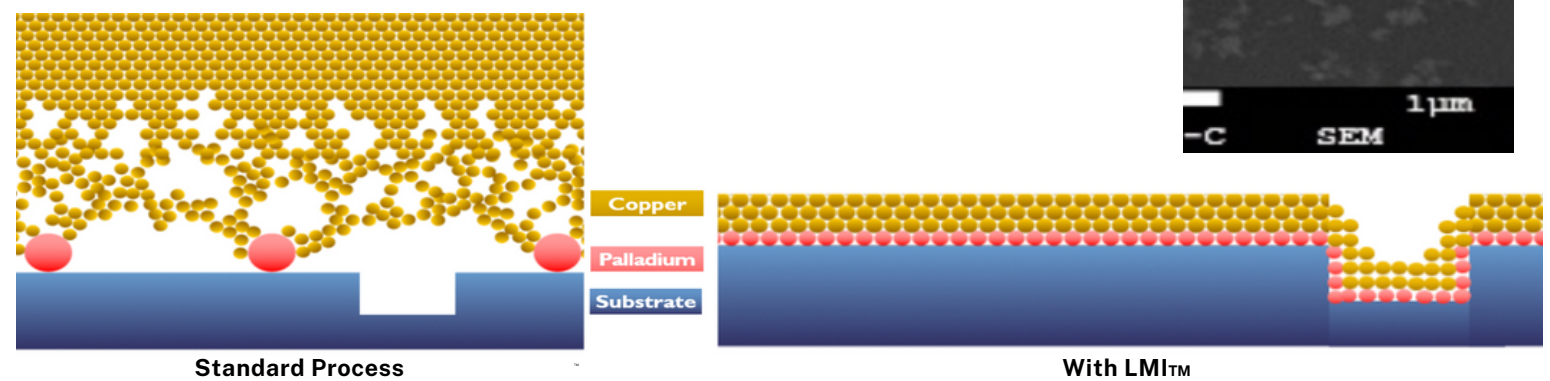
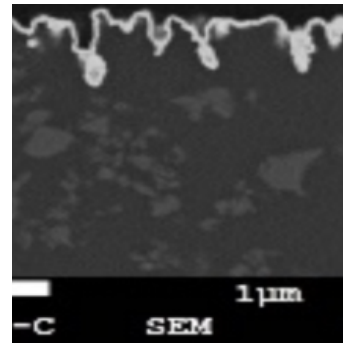
- Overall Size
- Number of Layers
- Number of Lamination Cycles

## CHEMISTRY FOR THE A-SAP™ PROCESS

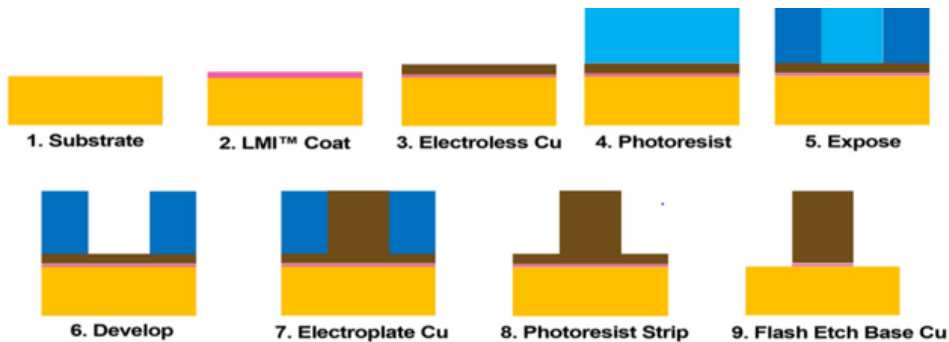
### LMI™ - Liquid Metal Ink

#### Thin, Uniform, and Dense Electroless Deposition

- **Ultra thin:** a few nanometers thick
- **Ultra dense:** fully packed atomic film
- **Conforms to any 3D surface at a nanometer scale**
- **Non-Aqueous:** enables low-cost manufacturing
- **Works for many different pure metals and alloys of those metals:** copper, gold, silver, palladium, platinum, etc.



## PROCESS FLOW



**Averatek**  
 Manufacturing technology for next-generation electronics capabilities. The development of key chemistries and advanced manufacturing processes for: very high density printed circuit boards, semiconductor packaging, RF and millimeter-wave passive components, simplified assembly to aluminum.

Contact our leadership team today at [tara@averatek.com](mailto:tara@averatek.com)  
[www.Averatek.com](http://www.Averatek.com)