



# AgeNT<sup>®</sup> Transparent Antenna Solutions

## CHASM ADVANCED MATERIALS, INC.



### Summary

AgeNT<sup>®</sup> transparent performance films enable practically “invisible” antennas without compromising performance. These printed circuit antennas can be mass-produced at low-cost, for diverse use cases.



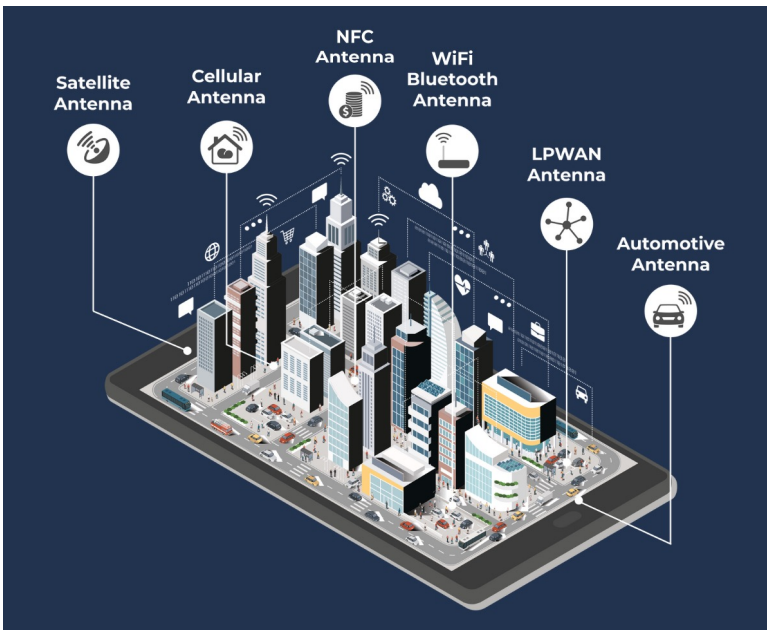
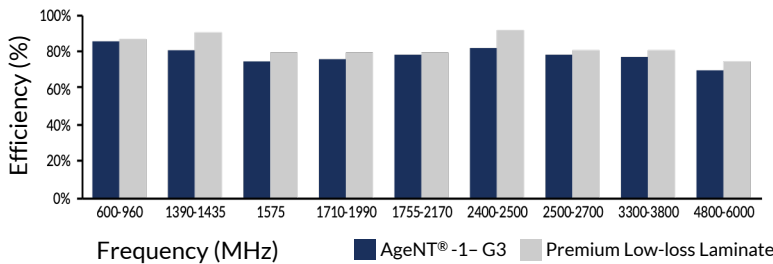
### Benefits

- ✔ High Transparency
- ✔ High Performance
- ✔ Thin & Flexible
- ✔ ‘Peel & Stick’ to Glass
- ✔ Low Cost
- ✔ Ready for Mass Production



### Exceptional Performance

Utilizing carbon nanotube/copper hybrid technology, AgeNT transparent antenna solutions deliver greater than 90% optical transparency with efficacy equivalent to low-loss, ceramic, PCB-based antenna options.



“Transparent antennas unleash design possibilities by enabling antenna placement not possible without transparency. They blend seamlessly into our environment while simultaneously delivering reliability, performance and cost advantages in diverse applications.”



### Transparent Antenna Applications

In production today, unobtrusive transparent antennas elegantly tackle connectivity hurdles by enabling antennas to be placed on glass surfaces such as lenses, windows and display screens, which often offer the optimal location for antenna placement but require visual clarity.

#### Camera Lenses

Integrate antennas into camera lenses, solving placement issues in outdoor cameras with metal housing



#### Wearables

Enable crucial high-performance connectivity for lightweight, AR glasses resembling standard eyewear



#### Building Windows

Utilize building glass for ‘peel-and-stick’ window antennas extending coverage in urban settings



#### Displays

Optimize ‘smart services’ by placing antennas directly on displays, achieving line-of-sight performance advantages



#### Vehicle Windows & Sunroofs

Inexpensively upgrade connectivity with ‘peel and stick’ window antennas or integrate satellite into sunroofs



For information about AgeNT<sup>®</sup> Transparent Antenna Solutions  
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### AgeNT<sup>®</sup> Performance Films for Antennas

	Total Transparency (%)	Sheet Resistance ( $\Omega/\square$ )	Minimum Feature Size (mm)
AgeNT-1-G2	90	0.8	3.0
AgeNT-1-G3	80	0.2	1.0



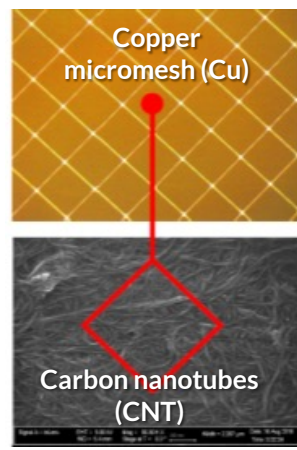
Quick Prototype



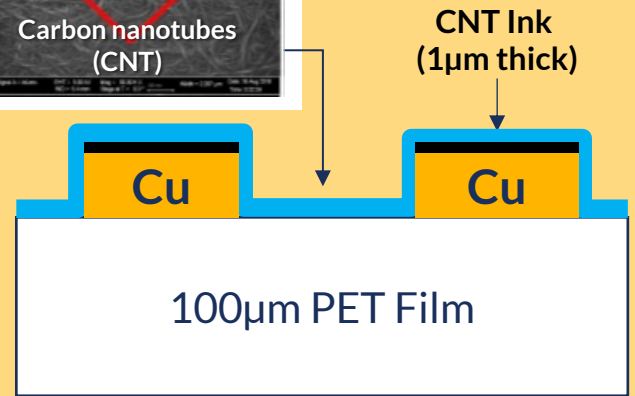
Mass Production



### Transparent Conductor Technology



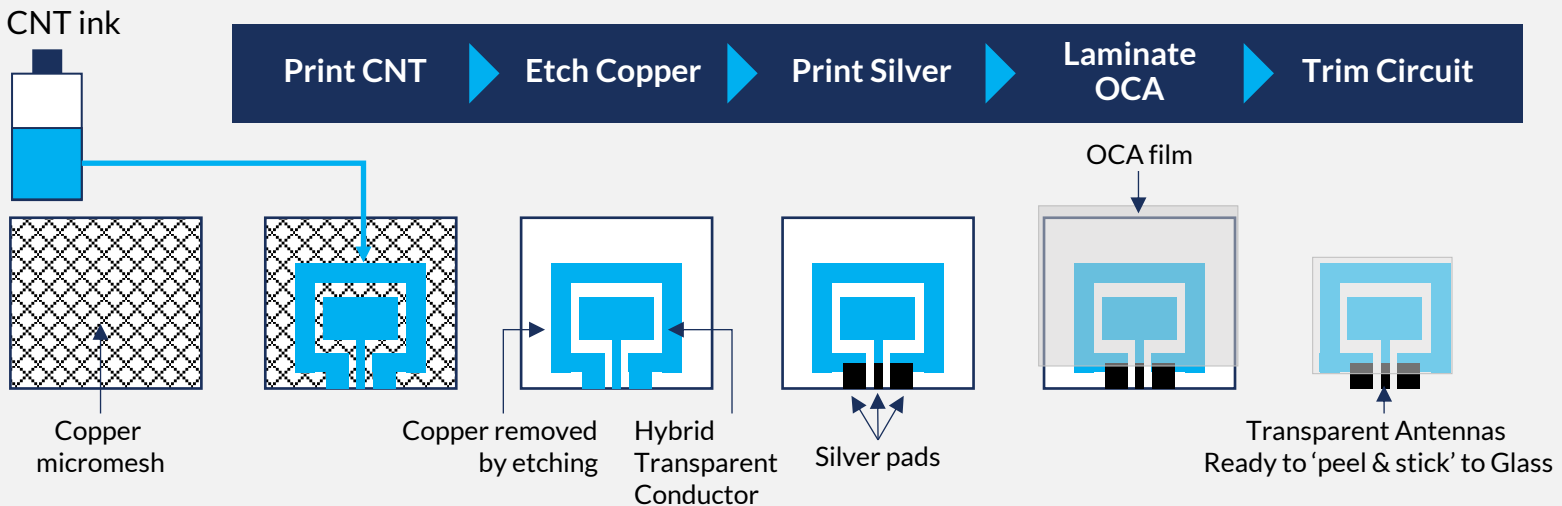
CHASM's AgeNT performance films utilize copper micromesh over PET film as its base layer. A thin layer of carbon nanotube (CNT) ink is then printed over the micromesh resulting in a highly conductive transparent CNT hybrid film.\*



\* CHASM's patented CNT Hybrid technology



### Low-Cost, Scalable Transparent Antenna Production Process



Reference Designs ➤ [Wideband Wi-Fi Coplanar antenna for 2.4GHz and 5.8GHz](#) ➤ [Narrow Band Patch Antenna for Band n78](#) ➤ [Microstrip Antenna](#)