and not for the first time.

PVN **Already** sells
Sicrys™ metal inks
based on the proprietary
Single Crystal Nano Technology

- Single-crystal nano particles already work in mass production
- Pure nano silver & nano copper particles inks
- IP protected

Silver

Nanoparticles

Copper

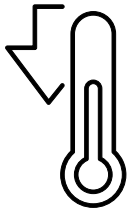
Nanoparticles

The Need

The industry must reduce silver consumption to meet projected wafer production levels. The ultimate goal is to transition to copper-based metallization.

The Copper Challenge

Avoid oxidation



Enable low-temperature copper processing

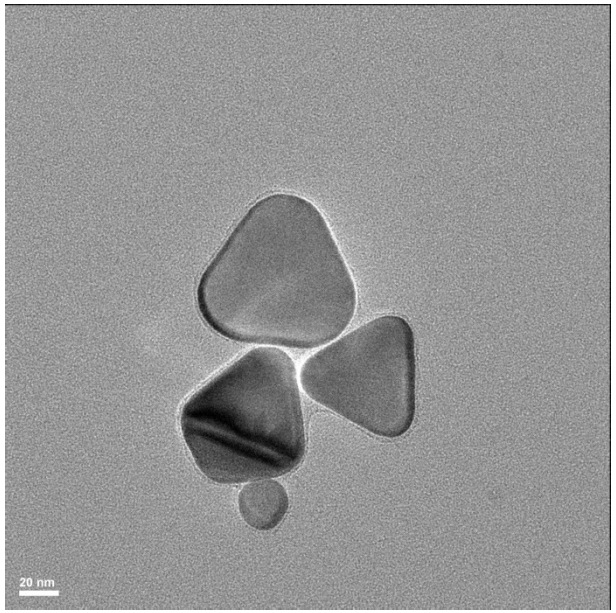
The Solution

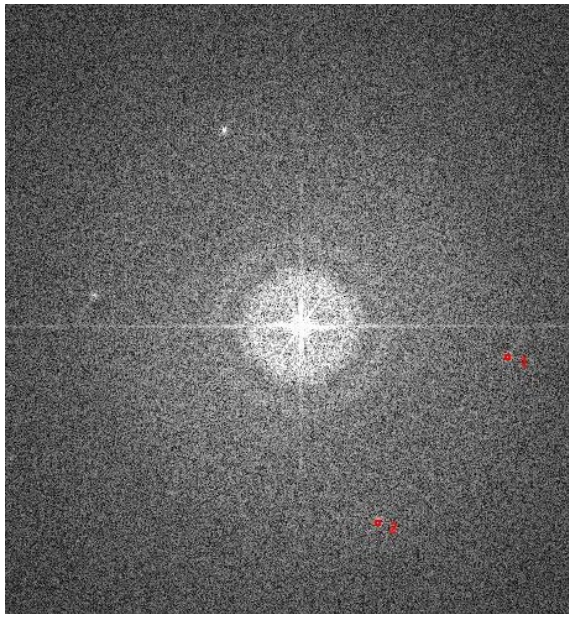
Copper Nanoparticles

pvnanocell

The Slow Oxidation Process Enables a Wider Processing Window at the Factory and Printing Level

- Our single-crystal nanoparticles offer superior oxidation resistance
- PVN produces its own Sicrys™ copper nanoparticles using an environmentally friendly process producing nanoparticles with d_{50} = 40 nm





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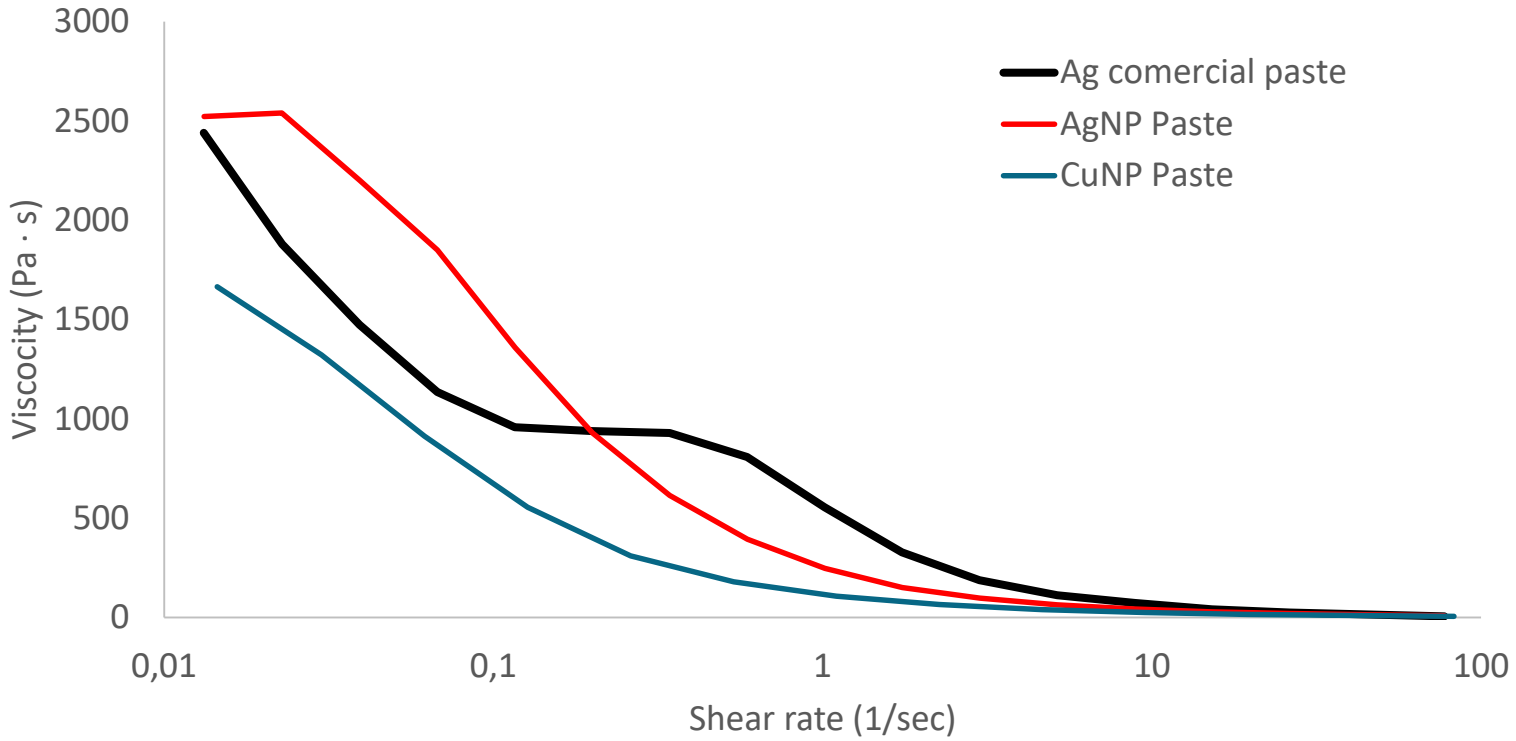
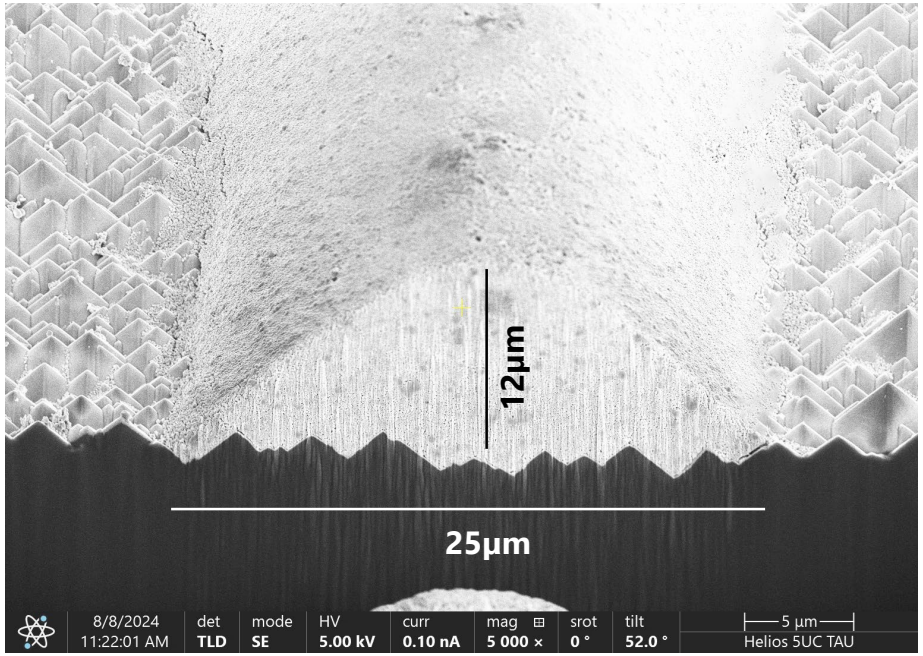
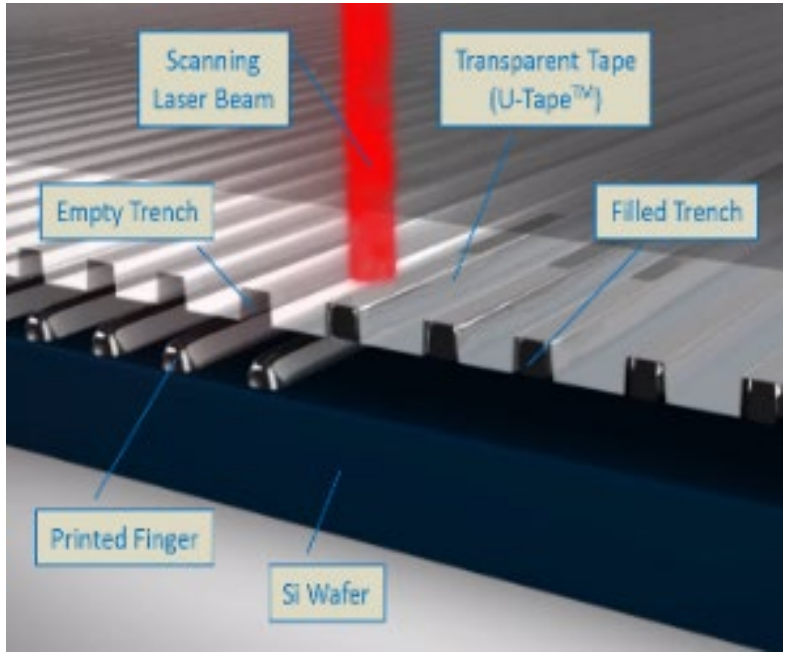
Similar Rheological Properties of Silver and Copper Nanoparticles



Printing 25 µm Copper Lines with PTP Technology





Source: Utilight Dr Laser

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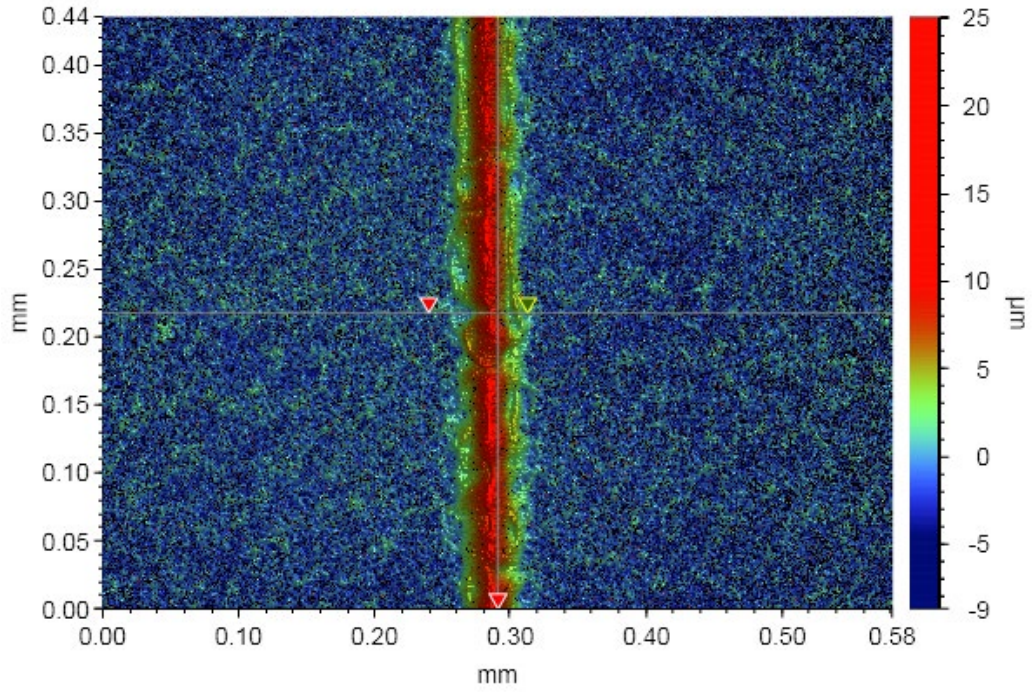
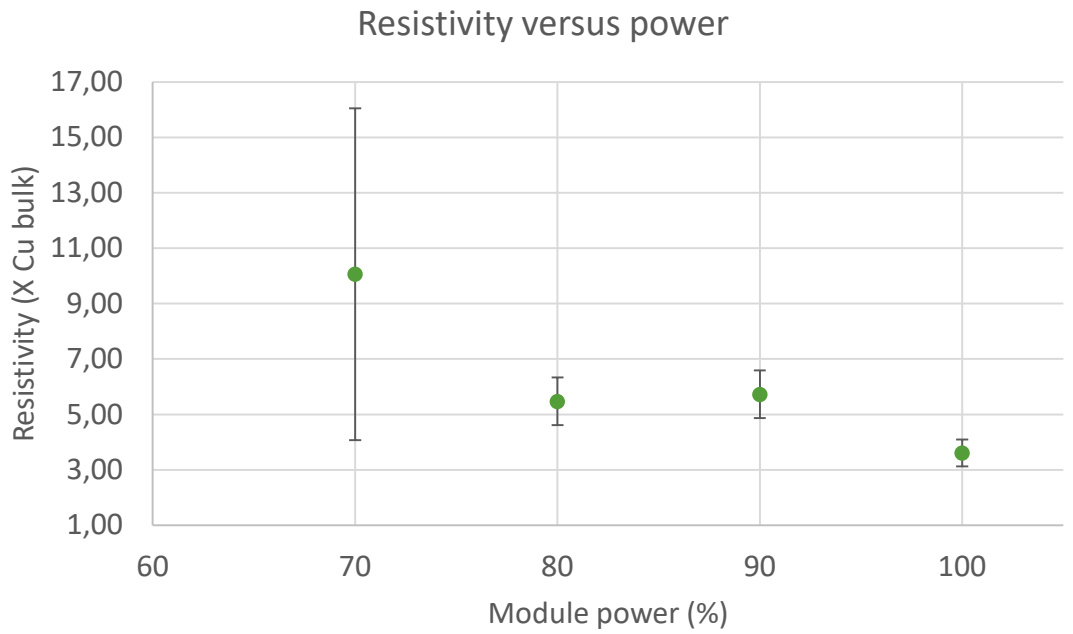
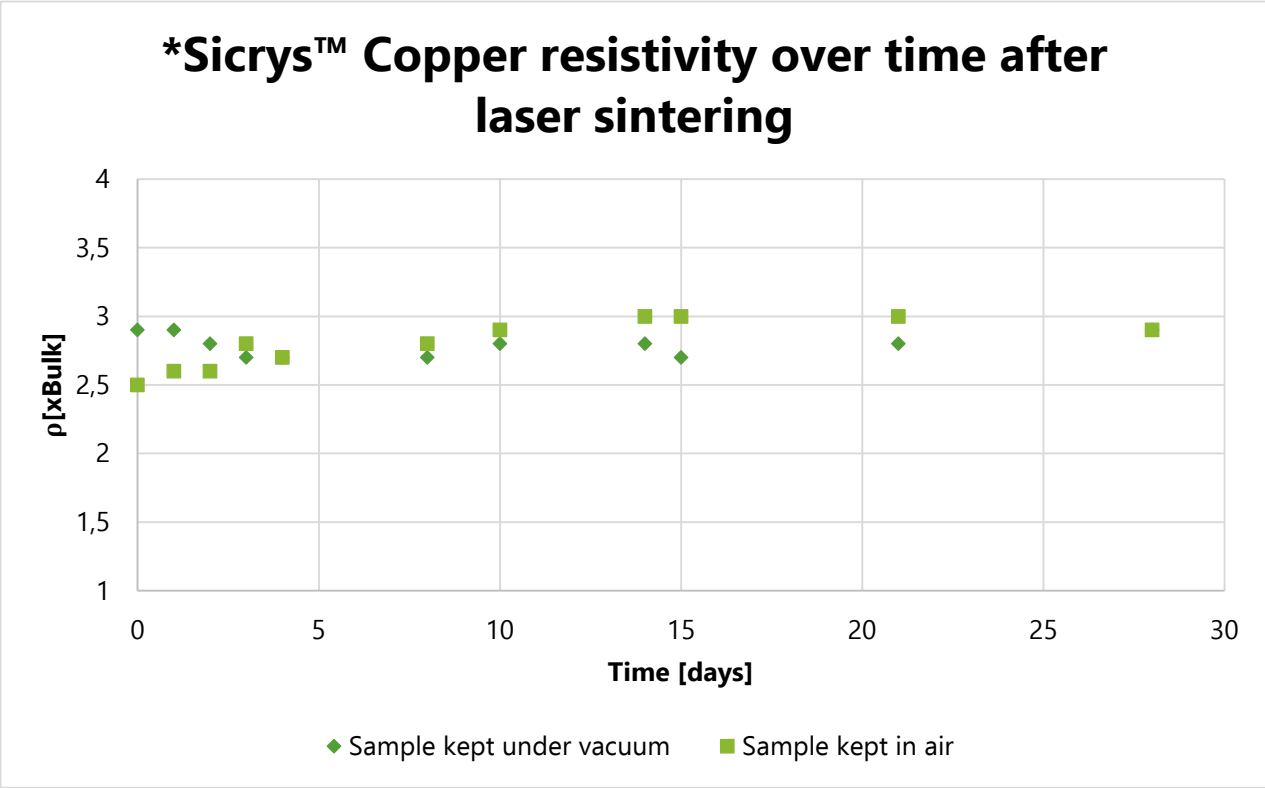
Initial Results of Laser Sintering Copper Paste



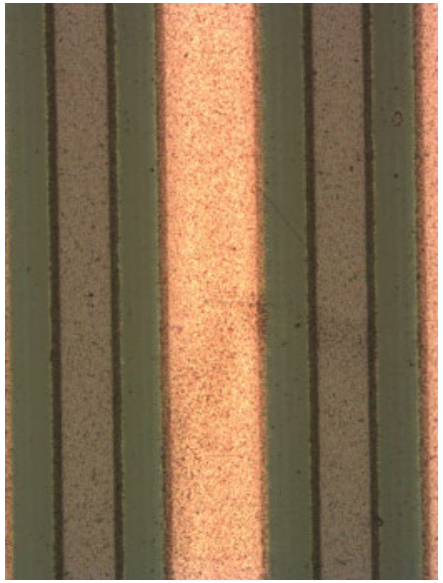


Initial Results of Laser Sintering Copper Paste



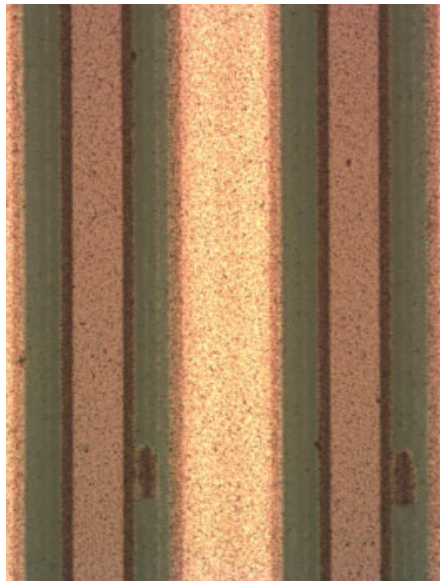
After 21 days

Air

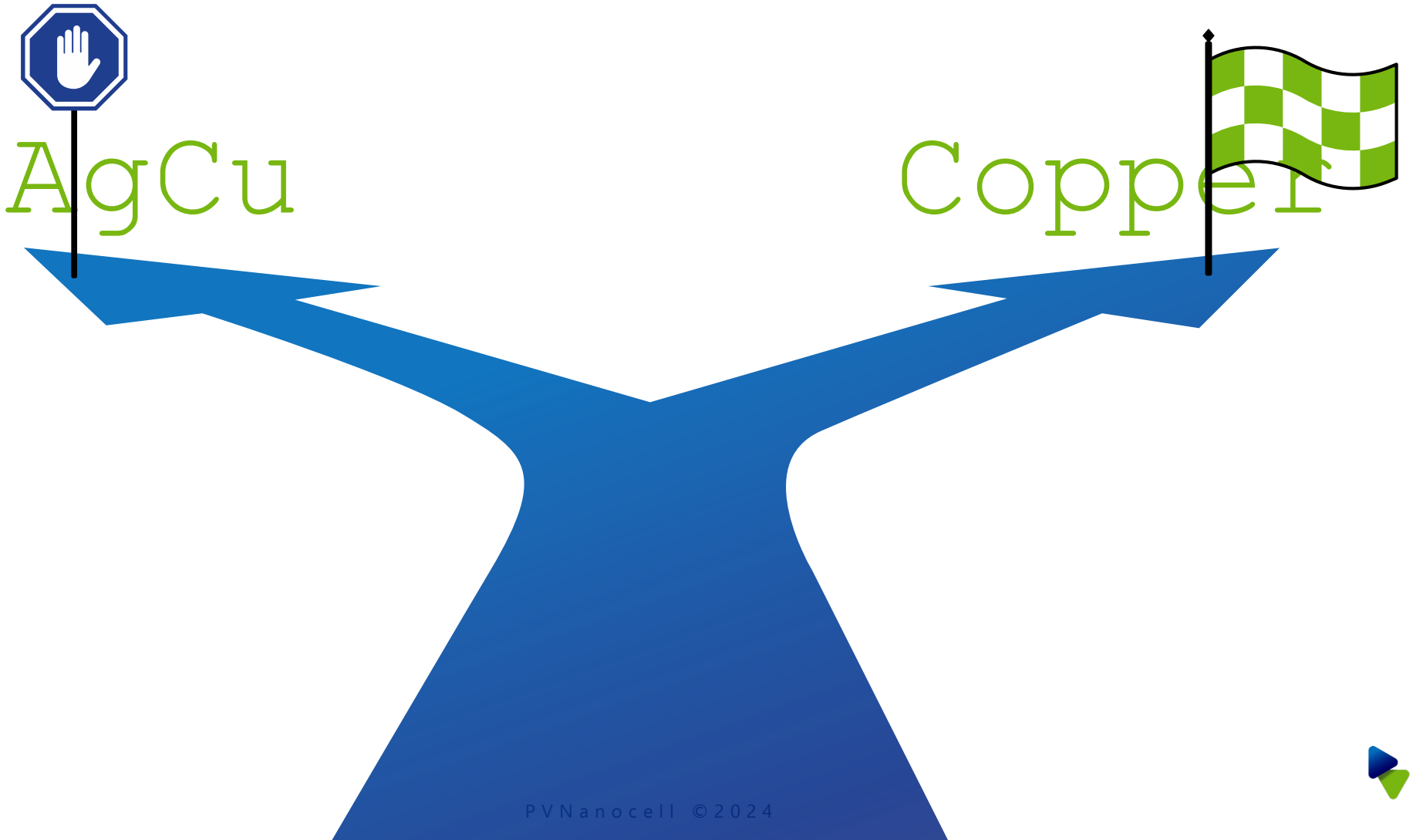


VS

Vacuum



While copper-coated paste represents a step forward, it doesn't offer the same level of innovation and performance benefits as pure copper paste



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Technology Roadmap

Alpha test

Q3, 2025

Working with strategic partners to push towards industry goals

The adoption of copper-based solution is not a matter of if, but rather when

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It’s Feasible

We Can Make it Happen

Our copper nanoparticles oxidation rate is slow and allows industrial mass production, printing, and module preparation time

Using laser sintering we achieve low resistivities and lines stable towards oxidation

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Thank you

Would love to
hear from you:

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