



## Electroless Plating Chemicals & Services

### Electroless metal plating chemicals and services

NANO3D provides Ni, Co and Cu electroless plating solutions and micro-fabrication plating services.

#### Key Benefits:

- **Conformal and uniform electroless plating**

- Step coverage of over 95% in high aspect ratios features (vias and trenches)
- WIW thickness non-uniformity of  $< 2\%$  @ 1 Sigma

- **Sulfur-free stabilizers**

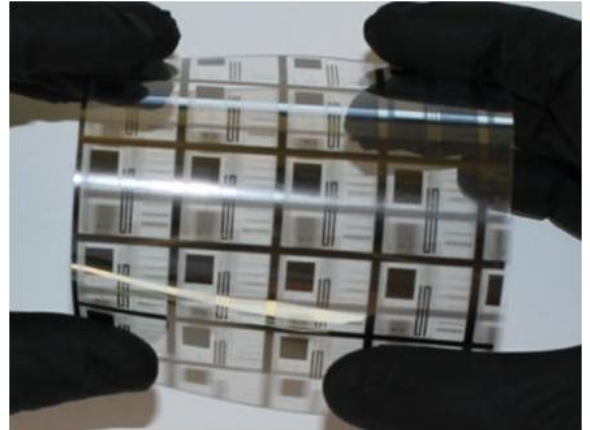
- The technology employs sulfur free stabilizer that drastically reduces decomposition of electroless plating solution.

- **Optimal Surface Roughness and Texture**

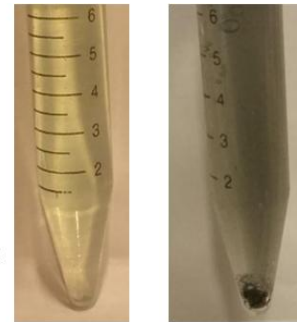
- Smooth surface morphology
- Strong (111) texture

- **Wide variety of substrates**

- The technology is applicable for the metallization of flexible (polymers, glass, ceramic, plastic, silicon et al.), patterned (vias & trenches) & stretchable substrates.



Electroless metal deposition on flexible substrates

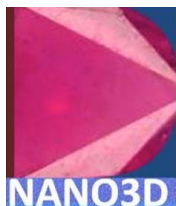


Stabilized Solution after Ni deposition

Stabilizer free solution After Ni deposition



Selective electroless metal plating over a catalytic photoresist on glass substrate



## Electroless Plating Chemicals & Services

### Electroless Ni & Co solutions

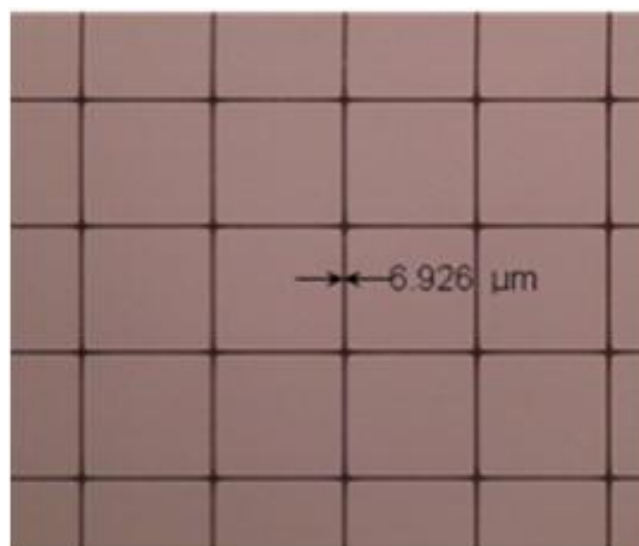
- **Stock solution**
- **Reduction agent solution**
  - Hypophosphite
  - DMAB
- **Plating additives**
  - Sulfur-free stabilizer
  - Wetting agent
- **Alloying elements**
  - W, Mo, Re, P, B
- **Metrology Standards**
  - LSL, Target, USL Stock Calibration Standards
  - LSL, Target, USL Additive Calibration Standards
  - Bath Metrology Reagents

### Electroless Cu solution

- **Stock solution**
- **Reduction agent solution**
  - Formaldehyde
  - Glyoxylic acid
- **Plating additives**
  - Stabilizer
  - Wetting agent
- **Alloying elements**
  - Sn, Zn, Ni, Co, Pd
- **Metrology Standards**
  - LSL, Target, USL Stock Calibration Standards
  - LSL, Target, USL Additive Calibration Standards
  - Reagents for Plating Bath Metrology

### Microfabrication plating services

- Photo-selective metal plating over variety of substrate (polymers, glass, silicon et al.) to form metal patterns down to 5  $\mu\text{m}$  width.
- Applications include transparent metal mesh for touchscreens, barrier/seed layers for damascene metallization, MEMS and IoT interconnects et al.



Metal patterns fabricated by photo-selective electroless plating

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