

TWO-STEP SINTERING TECHNIQUE FOR PRINTED ELECTRONICS APPLICATIONS

Technology Overview

Sintering is one of the most critical post-processing processes in electronics printing. Most printed electronics are fabricated with metallic nanoparticles inks, which are not electrically conductive when freshly deposited because the metallic nanoparticles are typically coated with organic additives to prevent agglomeration. The sintering process is therefore required to decompose these enveloping organic additives so that metallic nanoparticles can contact one another. General requirements for the sintering process include short sintering time, low temperature, good electrical conductivity of the sintered patterns, and minimum damages to both substrates and printed patterns. This technology focuses on selective sintering of metallic nanoparticles inks at short time and causing little deterioration to the substrates during the sintering process. The sintered patterns by the two-step sintering technique exhibit better electrical conductivity and surface morphologies as compared to the thermally sintered patterns. The two-step sintering technique therefore may be greatly beneficial in the field of on-demand 3D printing of electronics.

Potential Applications

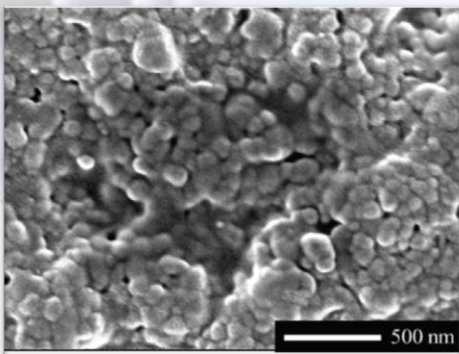
This assembly has been designed to sinter metallic nanoparticles inks without causing excessive damages to temperature sensitive substrates. Simple variations in the design can be carried out to cater the needs of researchers to sinter metallic nanoparticles inks on temperature substrates.

Customer Benefits

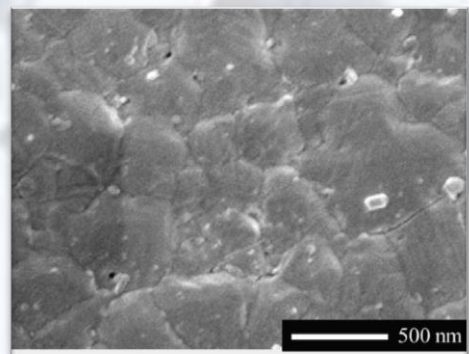
- Shorter sintering time
- Selective sintering
- Minimal damages to substrates
- Good electrical conductivity of the sintered patterns
- Cost-effective and customizable
- Universal concept to sinter any metallic nanoparticles ink

Features and Specifications

It is an sintering platform for sintering any metallic nanoparticles inks.



Silver nanoparticles ink thermally sintered at 150 °C for 240 mins.



Silver nanoparticles ink sintered by the two-step sintering technique for 2.5 mins.