KOARTAN
MICROELECTRONIC INTERCONNECT MATERIALS
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REV. 110212C

Technical Information

4100 Gold Conductor Paste

The thick film gold composition 4100 was designed for applications requiring good line resolution, smooth surface, and gold wire bonding. It is made with spherical gold particles, thus providing high film density and good edge definition, requirements for high frequency applications. Key features include:

- High Conductivity
- Good Line Resolution
- Smooth Surface
- High Wire Bond Adhesion
- Compatibility with Dielectrics and Resistors

TYPICAL FIRED FILM CHARACTERISTICS(1)

Fired Thickness	7-10 micrometer
Line Resolution	100/75 micron line/space using 325 mesh screen 75/75 micron line/space or better using high performance screen
Resistivity	$\leq$ 4 Milliohms / sq at 12 micron fired thickness
Wire Bond Adhesion(2)	
Initial	$\geq$ 11 grams
1000 Hours @ 150℃	$\geq$ 8 grams

(1) Typical properties are based on testing of several batches under various processing conditions. They are not intended as specification limits.
(2) Thermosonic wire bonding of 1 mil gold wire on 96% alumina substrate. All failures in the wire; no bond lifts.

COMPOSITION PROPERTIES

Viscosity: 275 $\pm$ 25 Kcps, when measured with Brookfield HBT viscometer, Spindle #14, utility cup, 10 RPM, 25℃.

Specific Gravity: 5.3 - 5.8 g/cm^3

Recommended Thinner: KOARTAN B-1194

RECOMMENDED PROCESSING PROCEDURE

Printing: Printing with 325 mesh stainless steel screen using 10-15 micron emulsion and 45 degree angle is recommended for most routine work. Special high performance screen with large open area to wire diameter ratio is recommended for fine line printing. Squeegee speeds of up to 6 inches/sec may be utilized.

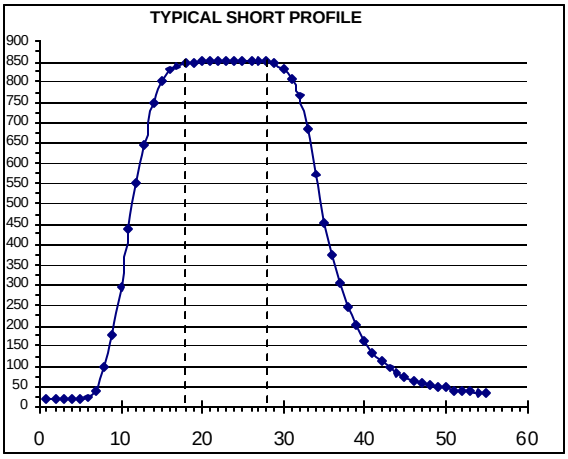
Coverage is approximately 60 cm^2 per gram when utilizing 325 mesh screen and a wet print thickness of about 35 micrometers.

Drying: Wet prints should be allowed to level for 5-10 minutes prior to drying. Dry for 10-15 minutes in a convection oven or belt dryer at 125°C-150°C.

Firing: Firing in air using a belt furnace and a 36-60 minute profile, with 10 minutes at a peak temperature of 850°C is recommended. Air flow rates must be optimized to ensure that the products of binder burn-off discharge properly and create a fully oxidizing atmosphere in the muffle.

Application Notes: If not handled properly, thick film gold conductors are prone to blistering. Circuits should be handled using gloves to avoid oily contamination from the fingertips. The rate of temperature rise during firing should not exceed 130°C /minute.

If the 4100 gold is printed on top of a silver-bearing viafill conductor, without a barrier layer, the viafill must completely fill the via hole, and preferably extend slightly higher than the top of the dielectric.



Temperature (°C) vs. Time (minutes)

Storage and Shelf Life: Store in tightly capped containers at room temperature. Shelf life is 6 months for unopened jars. Under ordinary conditions of storage and use the product should not require thinning. However, solvent loss during extended printing runs may be corrected by incorporating up to 0.5% of Koartan B-1194 thinner.

Other System Components:

Dielectric:	5807 (Gold & Mixed Metal) 5804 (Gold Only)
Inner Conductor	4100, 4150QJ (Gold) 6120 (Silver)
Via Fill:	4101 (Gold) 6101 (Silver)
Top Conductor	4225 (Al bondable Au) 4496 (Solderable Au) 6261 (Ag:Pd)
Resistor:	7600G, 7600GD Series