



MICROELECTRONIC INTERCONNECT MATERIALS

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Preliminary Technical Information

6292 SILVER-PALLADIUM PASTE

Cd-FREE, Pb-FREE COMPOSITION FOR ALUMINUM NITRIDE

The silver-palladium conductor composition 6292 was designed primarily for applications requiring high adhesion to AlN substrate, without the need for soldering. However, it is possible to solder to 6292 fired film by burnishing it or utilizing

Koartan's SILPALL FLASH 6296. Key features include:

- ? RoHS Compliant; Cd-Free, Pb-Free
- ? Good Line Resolution
- ? High adhesion to most AlN
- ? Compatibility with dielectrics and resistors.

TYPICAL FIRED FILM CHARACTERISTICS⁽¹⁾

Fired Thickness	12-16 μm
Line Resolution	175/125 μm line/space using 150/150 μm pattern and 325 mesh screen
Resistivity	18-22 milliohms / square at 16 μm fired thickness
Solder Acceptance⁽²⁾ 36/62/2 Sn/Pb/Ag	Requires Burnishing
Solder Leach Resistance⁽³⁾	3-5 Cycles
Adhesion⁽⁴⁾	
Initial	> 25 N
500 Hours @ 150°C	> 25 N

(1) Typical properties are based on testing of several batches under various processing conditions. They are not intended as specification limits.

(2) See application notes below.

(3) Cycles consist of 10-second dips in a 225 +/-5°C solder bath. Each cycle is preceded by dipping in Alpha 611 flux.

(4) The adhesion test consists of attaching 20 AWG tinned copper wire to .080"x.080" pads, by dipping in 225 +/-5°C solder for 5 seconds. The wires are then bent 90 degrees and pulled at constant speed, while a force gauge records the peel strength. Koartan's SILPALL FLASH 6296 is used to provide intimate contact between the wire and the pads.

COMPOSITION PROPERTIES

Viscosity: 140 ± 30 Kcps, when measured with Brookfield HBT, Spindle #14, utility cup, 10 RPM, 25°C

Specific Gravity: 3.8 – 4.2 g/cm³

Recommended Thinner: KOARTAN A-1039

RECOMMENDED PROCESSING PROCEDURE

Printing: Printing with 280 mesh stainless steel screen using 10-15 µm emulsion and 45 degree angle is recommended. Other mesh counts, 200-325, and emulsion thicknesses, 5-25 µm, may be used for special applications. Squeegee speeds of up to 10 inches/sec may be utilized.

Coverage is approximately 80 cm², when utilizing 280 mesh screen and a wet print thickness of about 38 µm.

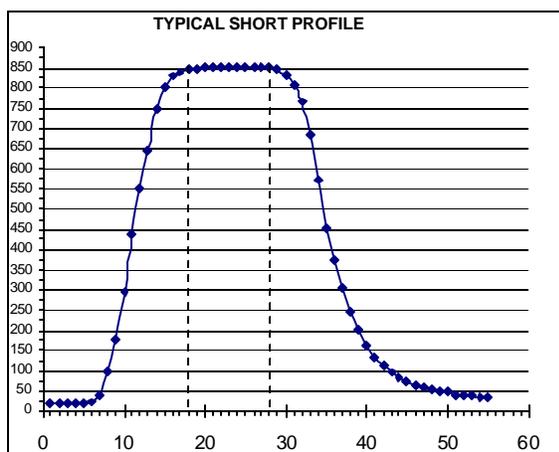
Drying: Wet prints should be allowed to level for 5-10 minutes prior to drying. Dry for 10-15 minutes in a convection oven or belt dryer at 125°C-150°C.

Firing: Firing in air using a belt furnace and a 36-60 minute profile, with 10 minutes

at a peak temperature of 850°C 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: When soldering conductors printed on AlN, it is important to keep in mind that the AlN quickly transfers heat away from any point source, such as a soldering iron. Preferably the solder should first be reflowed or fluxed printed coupon dipped in molten solder long enough for the coupon temperature to reach the solder bath temperature. Koartan's SILPALL FLASH 6296 provides a very thin layer of silver-palladium, which is designed to adhere to most Ag-Pd conductors and significantly improve their solder acceptance, regardless of substrate type.

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 A-1039 thinner.



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