

## Technical Information

# 4583 Thin-Print Alloyed Gold Conductor

The gold paste composition 4583 was designed to provide a versatile and very economical conductor for a variety of applications. Its low fired thickness and relatively lot TCR make it suitable for thin film resistor termination. Its dark color makes a candidate as a laser trimmable electrode for capacitors. It can be fired up to 1050°C, thus a high temperature conductor, as well as a candidate for formation heating

elements. With two separate print/dry/fire operations, it can also be soldered to and exhibits good soldered adhesion. Key features include:

- Thin Fired Film
- Very High Coverage, Economical.
- Solderable in Two Prints.
- Compatibility with Multilayer and Capacitor Dielectrics, and Resistors.

### TYPICAL FIRED FILM CHARACTERISTICS<sup>(1)</sup>

	ON 96% ALUMINA
<b>Fired Thickness</b>	
1 P/D/F, 325 mesh	3-4 $\mu\text{m}$
2 P/D/F, 325 mesh	6-7 $\mu\text{m}$
<b>Resistivity</b>	
1 P/D/F, milliohms / sq at 3 $\mu\text{m}$ fired thickness	350-450
2 P/D/F, milliohms / sq at 6 $\mu\text{m}$ fired thickness	140-180
<b>Solder Acceptance<sup>(2)</sup></b>	
36/62/2 Sn/Pb/Ag, 2 P/D/F	> 95%
<b>Solder Leach Resistance<sup>(3)</sup></b>	
Cycles @ 3 $\mu\text{m}$ fired thickness	> 7
Cycles @ 6 $\mu\text{m}$ fired thickness	> 15
<b>Adhesion<sup>(4)</sup></b>	
Initial @ 6 $\mu\text{m}$ fired thickness	14-20 N
100 Hours @ 150° C	14-20 N

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

(2) Solder acceptance is measured after a 5-second dip in the solder bath at 225°C +/-5°C for Sn/Pb/Ag 62/36/2, using Alpha 611 mildly activated flux.

- (3) Cycles consist of 10-second dips in solder at appropriate temperature. 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 solder for at the appropriate temperature for 5 seconds. The wires are then bent 90 degrees and pulled, while a force gauge records the peel strength.

## COMPOSITION PROPERTIES

**Viscosity:**  $150 \pm 30$  Kcps, when measured with Brookfield HBT, Spindle #14, utility cup, 10 RPM, @ 25°C

**Specific Gravity:** 1.80-2.30 g/cm<sup>3</sup>

**Recommended Thinner:** KOARTAN B-1194

## RECOMMENDED PROCESSING PROCEDURE

**Printing:** Printing with 325 mesh stainless steel screen using 10-15  $\mu\text{m}$  emulsion and 45 degree angle is recommended. Two P/D/F with 250-325 mesh screen may be utilized to obtain lower resistivity, higher leach resistance, and good aged soldered adhesion.

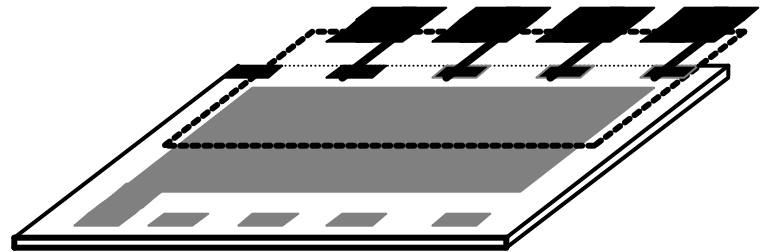
Coverage is approximately 160-200 cm<sup>2</sup>, when utilizing a 325 mesh screen and a dry print thickness of about  $11 \pm 2 \mu\text{m}$ .

**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. May be fired as high as 1050°C. 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:** May be used as a solderable termination for thick film capacitors. A thin print of the paste is

sufficient to form the capacitor termination. However, care must be taken that the solder pads are printed during the printing of both bottom and top plates.



*Schematic showing all five solder pads in a 4-unit capacitor array are printed twice.*

**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.