

## Technical Information

# 5807 Silver & Mixed-Metal Multilayer Dielectric

The 5807 dielectric composition was developed as a general purpose insulation material for high density multilayered circuitry. It provides excellent via resolution capability and is compatible with silver-based, gold-based, and mixed metal conductor systems. The 5807 dielectric is a crystallizing composition, thus allowing resistor firing and component attachment on top of it. Its coefficient of thermal expansion is matched to that of 96% alumina. It does not contain cadmium, lead,

nickel, or highly toxic organic solvents. Key features include:

- RoHS Compliant
- Wide Latitude in Firing. May be fired up to 875°C.
- Excellent Via Resolution.
- Compatible with Silver, Gold, and Alloyed Conductors.
- Dense, Hermetic, Crystallizing Composition.
- Firing in 36-60 Minute Profiles.
- Resistor Firing, Soldering, and Wire Bonding Capability.

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

<b>Fired Thickness</b>	36-48 $\mu\text{m}$
<b>Via Resolution<sup>(2)</sup></b>	200 $\mu\text{m}$ (0.008")
<b>Dielectric Constant<sup>(3)</sup></b>	7-10
<b>Dissipation Factor</b> @ 1KHz	$\leq .2\%$
<b>Insulation Resistance (IR)</b> Ohms @ 100VDC	$\geq 10^{12}$
<b>Dielectric Strength</b> VDC	$\geq 1000$
<b>Camber</b> 250 microns thick	$\leq .003"/\text{inch}$

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

(2) Using 325 mesh screen

(3) The electrical results are based on 0.350" x 0.600" capacitors fabricated with 5807 dielectric and 6120 silver pastes. Three layers of dielectric were utilized to achieve the recommended fired film thickness.

## COMPOSITION PROPERTIES

**Viscosity:** 280 ± 30 Kcps, when measured with Brookfield HBT viscometer, Spindle #14, utility cup, 10 RPM, 25°C

**Specific Gravity:** 1.80 – 2.20 g/cm<sup>3</sup>

**Recommended Thinner:** KOARTAN A-1039

## RECOMMENDED PROCESSING PROCEDURE

**Printing:** For best results, three separate print/dry/fire operations with 325 mesh stainless steel screen using 10-15 µm emulsion and 45 degree angle is recommended. Other mesh counts, 200-280, and emulsion thicknesses, 5-25 µm, may be used for special applications. A class 10,000 or better clean room is required if only two layers of dielectric are to be used.

To ensure excellent via resolution and good leveling, the 5807 possesses a special rheology. Use a screen with good tension and allow at least 45 mils of break away to avoid screen popping. Depending on the print area, squeegee speeds of up to 6 inches/sec may be utilized.

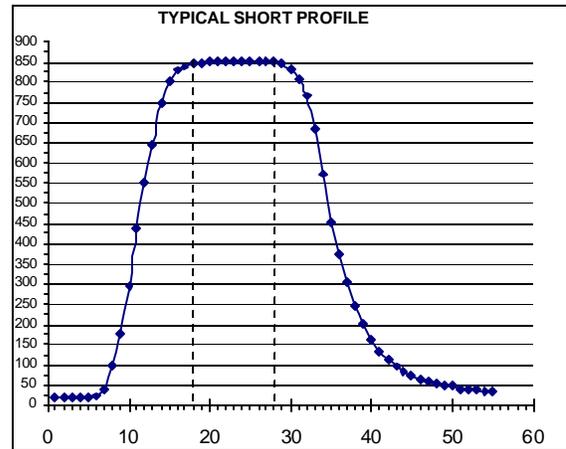
Coverage is approximately 120 cm<sup>2</sup>/g per layer, when utilizing 325 mesh screen and a wet print thickness of about 35 µm.

**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, 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.

**Storage and Shelf Life:** Store in tightly capped containers at room temperature. Shelf life is 6 months for unopened jars. Thorough mixing of the paste before each use is recommended. Under ordinary conditions of storage and use the product should not require thinning. However, solvent lost during extended printing runs may

be replaced by incorporating up to 0.5% of Koartan A-1039 thinner.



*Temperature (°C) vs. Time (minutes)*

### Other System Components:

	<u>Silver-Based</u>	<u>Gold-Based</u>
Inner Conductor	6120 (100% Ag)	4100, 4171, 4129 4150QJ
Via Fill	6101	4101
Top Conductor	6261 (6:1 Ag:Pd) 6231 (3:1 Ag:Pd) 6493 (Ag:Pd:Pt)	4100 or 4129 4225 4496
Resistor	7600D Series	7600GD Series

***In addition to the blue 5807, a red version 5807R, a green version 5807G, a white version 5807W, and a black version 5807B are also available.***

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