

## Preliminary Technical Information

# 4505 Low Fire Gold Conductor

The thick film gold composition 4505 is a cadmium-free paste that fires at 500°C. It is suitable for firing on 96% alumina and accepts gold wire bonding. The low firing temperature of this material makes ideal for applications on glass or porcelainized substrates, as well as repairing of circuits with resistors. Key features of the system include:

- Low Firing Temperature
- Cadmium Free
- Good Line Resolution
- High Film Density
- Good Electrical Conductivity
- Gold Wire Bondable
- Excellent Adhesion

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

<b>Fired Thickness</b>	9 -12 microns
<b>Line Resolution</b>	175/150 micron line/space using 325 mesh screen
<b>Resistivity<sup>2</sup></b> Milliohms / sq at 12 micron fired thickness	≤ 10
<b>Wire Bond Strength<sup>(3)</sup></b> 1 mil gold wire	> 8 grams

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

(2) Measured on a 20 mil wide track, 254 squares.

(3) Thermosonic gold wire bonding performed on plasma cleaned substrates. All wire breaks, at second bond.

### COMPOSITION PROPERTIES

**Viscosity:** 180 ± 40 Kcps, when measured with Brookfield HBT, Spindle #14, utility cup, 10 RPM, 25°C.

**Specific Gravity:** 4.4 – 5.0 g/cm<sup>3</sup>

**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. Other mesh counts, 230-250, and emulsion thicknesses, 5-25 micron, may be used for special applications. Squeegee speeds of up to 6 inches/sec may be utilized.

Coverage is approximately 60 cm<sup>2</sup>, when utilizing 325 mesh screen and a wet print thickness of about 38 micron.

**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 22-40 minute profile, with 10 minutes at a peak temperature of 500°C-510°C or 3 minutes at a peak temperature of 525°C-530°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. 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 Low Temperature Pastes:

*Overglaze:* 5650 500°C  
5651 Pb-Free 500°C

*Conductor* 6165 500°C Silver

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