

## Technical Information

# 6165-SI Silver Conductor Paste

## 500°C Firing Composition for Silicon Substrate

The thick film silver conductor 6165-SI is designed for applications requiring low temperature processing on silicon substrate. It provides a dense and smooth film when fired at 400°C -500°C. A high solids version of this paste is available for plugging holes in silicon. The fired film of the 6165-SI is malleable and conforms to the constraints of the substrate. However, due to very brittle nature of silicon, fired thicknesses in excess of 20 microns should be avoided to

eliminate the possibility of surface fracture at the silver-silicon interface. The 6165-SI does not contain cadmium, nickel, or highly toxic organic solvents. Its key features include:

- RoHS Compliant
- High Conductivity
- Good Line Resolution
- High Speed Printing
- Compatibility with Silicon Substrate

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

<b>Firing Temperature</b>	450°C, 10-30 minutes
<b>Fired Thickness</b>	10-12 μm
<b>Line Resolution</b>	200/175 μm line/space
<b>Resistivity</b>	≤ 3.0 milliohms/square at 12 μm fired thickness

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

### COMPOSITION PROPERTIES

<b>Viscosity:</b>	120-180 Kcps, when measured with Brookfield HBT viscometer, Spindle #14, utility cup, 10 RPM, 25°C
<b>Specific Gravity:</b>	3.6 – 4.0 g/cm <sup>3</sup>
<b>Recommended Thinner:</b>	KOARTAN A-1039

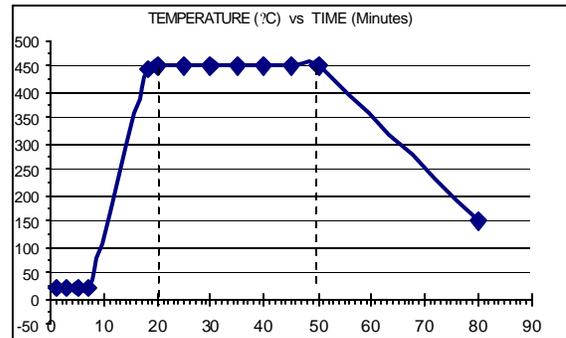
## RECOMMENDED PROCESSING PROCEDURE

**Printing:** Printing with 325 mesh stainless steel screen using 10-15  $\mu\text{m}$  emulsion and 45 degree angle is recommended. Other mesh counts, 200-400, and emulsion thicknesses, 5-25  $\mu\text{m}$ , may be used for special applications. Squeegee speeds of up to 10 inches/sec may be utilized.

Coverage is approximately 80  $\text{cm}^2/\text{g}$ , when utilizing 325 mesh screen and a wet print thickness of about 36-38  $\mu\text{m}$ .

**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 or box furnace 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. A temperature profile as shown the figure below is recommended. Firing to temperatures as low as 400°C is permissible if the soak time is sufficiently long.



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

### Other System Components:

Cross-Over Dielectric, 850°C	5828-SI
Sealing Glass, 450°C	5643W
Sealing Glass, 450°C	5645-SI
Green Overglaze, 500°C	5650-SI

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