

## Technical Information

# 5650 Resistor Overglaze

The 5650 overglaze is suitable for the protection of resistor chips, networks, and hybrid circuits. Its low firing temperature results in relatively minor shifts in the value of most resistors. Its green color absorbs laser energy and results in fast trimming speeds. The 5650 can be used for the protection of thick film capacitors and ferrite core inductors, if a low CTE buffer layer, such

as KOARTAN 5650H, is printed first. The 5650 composition does not contain cadmium or highly toxic organic solvents. Key features include:

- Fast Laser Trimming
- Excellent hermeticity.
- Compatibility with most resistor systems.

### TYPICAL FIRED FILM CHARACTERISTICS

<b>Color</b>	Green
<b>Firing Temperature</b>	500°C - 525°C
<b>Surface Finish</b>	Shinny

### COMPOSITION PROPERTIES

<b>Viscosity:</b>	130 ± 30 Kcps, when measured with Brookfield HBT, Spindle #14, utility cup, 10 rpm, 25°C.
<b>Specific Gravity:</b>	1.8 - 2.4 g/cm <sup>3</sup>
<b>Recommended Thinner:</b>	KOARTAN A-1039

## RECOMMENDED PROCESSING PROCEDURE

**Printing:** Printing with 250 mesh stainless steel screen using 10-15  $\mu\text{m}$  emulsion and 45 degree angle is recommended. Other mesh counts, 200-325, and emulsion thicknesses, 5-25  $\mu\text{m}$ , may be used for special applications.

Coverage is approximately 130  $\text{cm}^2$  per layer, when utilizing 250 mesh screen and a wet print thickness of about 35  $\mu\text{m}$ .

**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 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.

**Application Notes:** A thin layer of 5650 overglaze is recommended for most applications requiring circuit protection from the environment.

For encapsulation of small thick film capacitors two layers of 5650 are recommended. For larger capacitors, or dielectrics with large TCE mismatch to alumina substrate a special buffer material

5650H may be required prior to the application of the 5650. Please consult Koartan's technical staff for your particular application.

**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 loss during extended printing runs may be replaced by incorporating up to 0.5% of Koartan A-1039 thinner.

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