DuPont Microcircuit Materials

THICK FILM COMPOSITION

Interra™
EP320 Copper Composition

Product Description

EP320 copper conductor is intended for use with EP310 capacitor dielectric paste to create capacitors fired on copper foil substrates. These pastes are designed so the dielectric and top conductor can be cofired for ease of processing. Capacitors made with these pastes can be embedded within printed circuit boards.

Processing

Substrates

Properties are based on tests on non-drum side 1 oz Oak-Mitsui PLSP grade ED copper foil substrates.

Printing

A 325 or 400 mesh stainless steel screen with a 0.5 mil emulsion thickness is recommended. Printing speeds up to 3 inch/sec can be used. A V-screen 330 mesh may also be used.

Drying

Allow prints to level for 5 minutes at room temp. Dry 10 minutes at 120°C in air or N_2. Drying above 150ºC in air will oxidize the copper and affect the properties and performance of the fired film.

Firing

Dried parts should be fired in a belt furnace. A total cycle time of 60 minutes and a peak temperature of 940ºC - 950°C for 10 minutes is recommended. Nitrogen atmosphere must be used and oxygen levels in the burnout and firing zones of the furnace should be optimized and tightly controlled. *See DuPont Embedded Passives Processing Guidelines for more details.*

Typical Fired Properties

Test	Properties
Fired Thickness (µm)	2 - 4
Resistivity (mΩ/sq) (@6 µm fired thickness)	<10
Adhesion on 1 oz copper foil: 1PC-TM-650 (Tape) Adhesion test	No failure

Table 1 shows typical fired properties for EP320

Composition Properties

Test	Properties
Viscosity (Pa.S) [Brookfield ½RVT, SC4-14/6R UC&SP, 10 rpm, 25ºC]	20 - 35
Coverage of wet paste (cm²/g) (At 0.6 mil wet print)	250
Thinner*	9450
*EP320 is optimized for screen printing and thinning is not normally required. Thinner may be used for slight viscosity adjustments or to replace evaporations loses.	

Table 2 shows composition properties for EP320

Storage and Shelf Life

Containers should be stored, tightly sealed, in a clean, stable environment at room temperature (<25° C). Shelf life of material in unopened containers is six months from date of shipment. Some settling of solids may occur and compositions should be thoroughly mixed prior to use.

Safety and Handling

The following precautions should be exercised when handling EP320:

- Use with adequate ventilation
- Avoid prolonged contact with skin
- If contact with skin occurs, wash affected area immediately with soap and water
- Avoid prolonged breathing of vapor
- Dangerous if swallowed - DO NOT CONSUME
- Refer to MSDS for more details

For more information on EP320 or other DuPont Microcircuit Materials products, please contact your local representative:

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