

Technical Data Sheet

THICK FILM MATERIALS

Product Type: Dielectrics

Product Name: IP 9117E



REACH Compliant Multilayer Dielectric

Description

IP 9117 E is a permanent blue 850 °C firing dielectric composition, displaying the following benefits:

Key Benefits

- Expansion coefficient is closely matched with that of alumina, to provide for minimal substrate bowing
- Extremely dense, hermetic fired film allows for excellent electrical performance at a fired thickness of $\geq 40 \mu\text{m}$
- Excellent solderability and adhesion of Ag, Ag/Pd, Ag/Pt, Au and Au/Pt conductors on top of dielectric
- Resistors can be processed on top of dielectric
- Absence of the "Battery Effect"³
- Free of cadmium, nickel and phthalate
- REACH³ and ROHS⁴ compliant

Processing

- 1) Spatulate well prior to processing.

When stored in a refrigerator, allow paste to come to room temperature prior to opening, to avoid condensation.

- 2) Print individual layers with a 200 – 325 mesh stainless steel screen. For best via resolution, a 325 mesh screen is recommended; whenever possible, a double wet pass of the squeegee is advised, to minimize pin holes.
- 3) Level at room temperature for 5 – 10 minutes.
- 4) Dry at 150 °C for 10 – 20 minutes.
- 5) All layers of the interconnected structure should be fired separately. Fire in air, with a 30 – 60 minute cycle to a peak temperature of 850 °C. Dwell time should be 9 – 11 minutes. Properties are unaffected by multiple refirings.
- 6) Conductor and dielectric film thicknesses should be controlled carefully, to ensure high yield in production. Conductor thickness under dielectric film should not exceed 12 μm FFT.

Thinner

HVS 507

Typical Properties (Paste)

Form	Pseudoplastic paste
Viscosity	45 – 75 Pas (23 °C, D = 33/s)
Solids	74.0 \pm 1.5 %
Printing Speed	Up to 10 cm/s
Coverage	c. 70 cm ² /g (40 μm FFT)
Shelf Life	6 months from date of shipment with correct storage (in a dry, cool (5 – 25 °C) and dark place with container tightly shut).

Typical Properties (Fired)¹

Fired Film Thickness ² (FFT)	$\geq 40 \mu\text{m}$ (3 separately fired layers)
Rel. Diel. Constant K	7.5 – 9.5 (25 °C, 1 kHz)
Insulation Resistance	$> 10^{12} \Omega \times \text{cm}$ (25 °C)
Dissipation Factor	$< 0.5 \%$ (25 °C, 1 kHz)
Breakdown Voltage	$> 500 \text{ V}$ at 40 μm FFT
Via Resolution	$\geq 300 \mu\text{m}$

Compatibility

Overglazes	IP9025ST IP9029H
Conductors	Ag C1075D C1075SD (LPA411-076) AgPt C1076SD (LPA609-022) AgPd C1200D Series C2000 Series AuPt C6012 Au C5007
Resistors	R8009 (WP 09-XY) Series

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Legend:

- 1) Typical properties based on laboratory test methods. For optimum results all materials should be fired in a profiled furnace supplied with dried, hydrocarbon and other contaminant free air (PP-1). Also depends in general on associated conductor materials employed, processing conditions and measurement methods.
- 2) Measured after printing with a 325 mesh steel screen; screen thickness and emulsion thickness combined was c. 75 µm.
- 3) A separation of dissimilar conductor metallizations such as gold and silver is possible without blistering. This enables the use of more cost-effective, high conductive pure silver underneath the dielectric.
- 4) REACH compliant according to the latest ** Annex XIV to Regulation (EC) of the European Parliament and of the council on the Registration, Evaluation, Authorisation and Restriction of Chemicals ("REACH") by European Chemicals Agency and its subsequent amendments; the material does not contain any substance listed in Annex XIV.
- 5) RoHS compliant according to the latest ** Directives (European Union) of Restriction of Hazardous Substances ("RoHS") and its subsequent amendments (including the exceptions related to Pb)

* See the data sheet issue date (DD/MM/YY) as reference of validity of latest edition which is available on request

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