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MULTILAYER DIELECTRIC COMPOSITION 4929-G

RoHS Compliant*

ESL 4929-G dielectric is a non-porous blue multilayer dielectric with an excellent TCE match to 96% alumina. It is possible to print and fire many layers of this dielectric with minimal distortion of the substrate. Substrate sizes up to 150 mm x 100 mm x 1 mm can be used successfully with multiple large area prints of 4929-G. Screen gaps up to 1.8 mm are used with the large area screens (300 mm x 300 mm) that are necessary to print large circuits. This dielectric can be used in multilayer builds using gold or silver based products. Typical systems in use are 9695-G/4929-G/9635-G and 8844-G/4929-G/8846-G. Via filling should be carried out using 8835-VFG in gold based multilayer systems and with 9695-G in mixed metallurgy systems. It is possible to resolve 175 µm vias using 4929-G. Both gold based and silver based conductors may be used as the resistor termination on top of the dielectric, but different resistor values and TCR shifts will be observed.

PASTE DATA

Rheology:	Thixotropic, screen-printable paste
Viscosity: (Brookfield RVT, 10rpm,: ABZ spindle, 25.5 ± 0.5 °C)	375 ± 25 Pa.s
Colour:	Light blue
Shelf Life (20 - 25 °C):	6 months

PROCESSING

Screen Mesh, Emulsion:	Gold bearing conductor:	325 S/S, 25 µm
	Silver bearing conductor:	200 S/S, 25 µm
Levelling Time (20°C):		5 - 10 min
Drying at 125°C:		10 - 15 min
Firing Temperature Range:		850 - 950°C in air
	Optimum:	850°C
	Time at peak:	10 min
Total Firing Cycle:		1 hour
Substrate for Calibration:		96% alumina
Thinner:		ESL 401

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TYPICAL PROPERTIES

Fired Thickness:
(at least 2 layers between conductors on 96% alumina)

Gold based system	35 - 40 µm
Silver based system	45 - 50 µm

Approximate Coverage:
(40µm thickness) 60 - 70 cm^2/g

Dielectric Constant (K) at 1 kHz:
(at 25°C) 7 - 10

Dielectric Constant (K) at 1 MHz:
(at 25°C) 6 - 8

Dissipation Factor at 1 kHz:
(depending upon conductor, at 25°C) <0.4%

Insulation Resistance:
(at 100V DC) $>10^{11}$ Ω

Breakdown Voltage:
(at 25°C in air) > 1000V / 50µm

Via Definition:
175µm x 175µm

Solder Wettability of Conductors over 4929-G Dielectric:
(RMA flux, 5sec. dip, 62Sn/36Pb/2Ag, at 220°C)

9635-G (Ag/Pd)	95 %
5837-G (Pt/Au)	85 - 90 %
9695-G (Ag/Pd)	85 - 90 %

For other information please see the relevant conductor data sheet