

DuPont 6444

DIELECTRIC

Technical Data Sheet

Product Description

DuPont 6444 is a filled, crystallizable screen printed thick film dielectric composition. It is a versatile dielectric for use in both high reliability and low cost MCM (Multi-Chip Module) and hybrid interconnect applications.

Product Benefits

- Broad conductor compatibility (gold, silver, and mixed metal)
- Thin, 2 print, hermetic dielectric film.
- High resistance to E.M.F. (electro-motive force) blistering and shorting.
- Robust electrical and mechanical properties.
- Compatible cofireable conductors

Processing Substrates

Properties are based on tests on 96% alumina substrates. Substrates of other compositions and from various manufacturers may result in variations in performance properties.

Printing

Printing should be carried out in a clean and well ventilated area. The combined fired thickness of the dielectric should be $30 \pm 2 \mu\text{m}$. This can generally be obtained by printing the individual layers with a 230-280 mesh stainless steel screen at speeds of 6 ips.

Drying

Allow prints to level for 5-10 minutes at room temperature. Then dry for 10-15 minutes at 150°C .

Typical Fired Properties

Test	Properties
Fired thickness (μm)	30 ± 2
Resolution (diameter)	250-300 μm
Max. no. circuit layers	< 8
Camber*** (mil/in)	< 2
Dielectric Constant (@ 1 KHZ)	8-10
Dissipation Factor (@ 1 KHZ) (%)	< 0.2
Insulation Resistance (ohm) (@ 100 VDC recommended thickness)	$\geq 10^{12}$
Leakage Current* ($\mu\text{A}\cdot\text{cm}^2$)	< 1
Breakdown Voltage (V/30 μm)	> 1000
EMF Blister Resistance**	> 30 firings

Composition Properties

Viscosity (Pa.s) (Brookfield HBT, utility cup and spindle [SC4-14/16R] 50 rpm, $25^\circ\text{C} \pm 0.2^\circ\text{C}$)	80-120
Thinner	DuPont 4553
Coverage (cm^2/g) (based on a fired thickness of 14 μm)	110-130

* Standard measurements made after 5 min @ 10VDC

** Maximum no. of firings performed without blisters observed with Substrate/Au/DielAg configuration

*** Measured deflection of 5" x 1" substrate with 5 circuit layers. Single-sided.

This table shows anticipated typical physical properties for DuPont 6444 based on specific controlled experiments in our labs and are not intended to represent the product specifications, details of which are available upon request.

Firing

Fire in well-ventilated moving conveyor furnace, in air with a 30-minute cycle, to a peak temperature of 850°C.

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

For Safety and Handling information pertaining to this product, read the Material Safety Data Sheet (MSDS).

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