

DuPont LF151

DIELECTRIC COMPOSITION

Technical Data Sheet

Product Description

DuPont LF151 is a filled, crystallizable screen-printed thick film dielectric composition and is an integral element of System LF. It is a versatile dielectric intended for use in both high reliability and low cost MCM (Multi-Chip Module) and hybrid interconnect applications.

Product Benefits

- Lead, Cadmium, Chromium and Nickel Free*
- Broad conductor compatibility (gold, silver and mixed metal)
- Compatible with cofirable conductors
- Highly resistant to EMF (electro-motive force) blistering and shorting
- Robust electrical and mechanical properties
- Dense, hermetic microstructure

*Cadmium, chromium, nickel and lead "free" as used herein means that these are not intentionally added to the referenced product. Trace amounts however may be present.

Design Note

The fired thickness of the dielectric layer should be at least 30 mm between the conducting layers this can be achieved with 2 prints of the dielectric. Each printed dielectric layer should be separately fired. Co-firing is not recommended.

Processing Conditions

Printing

230 to 280 stainless steel screen, at a print speed of 15cm/sec (see design note).

Drying

Allow prints to level for 10-15 minutes at room temperature, and then dry for 10-15 minutes at 150°C.

Typical Physical Properties

Test	Properties
Viscosity (Pa.s) [Brookfield HBT, UC&SP, 50 rpm, 25°C]	70-110
Coverage (cm ² /g) [Based on average fired thickness of 14mm]	110-130
Thinner	DuPont 4553
Total Fired Thickness (mm)	> 30
Dielectric Constant (@1MHZ)	8-10
Dissipation Factor (@1MHZ)	<0.5%
Leakage Current ¹ [μA/cm ²]	<1
Insulation Resistance [30μm]	>10 ¹² @ 100VDC
Mean Breakdown Voltage [30μm]	>1.6kv
Via Resolution (μm)	250 - 300
¹ Standard measurements made after 5 minutes at 10VDC	

This table shows anticipated typical physical properties for DuPont LF151 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

850°C peak held for 10 minutes on 30 minutes cycle in an air atmosphere.

Recommended Processing Procedure

Substrates

Substrates of different compositions and from various manufacturers may result in variation in performance properties.

Thinner

This composition is optimized for screen-printing, thinning is not normally required. Use the DuPont recommended thinner for slight adjustments to viscosity or to replace evaporation losses. The use of too much thinner or the use of a non-recommended thinner may affect the rheological behavior of the material and its printing characteristics. Refer to table 1.

Printing

The composition should be thoroughly mixed before use. This is best achieved by slow, gently, hand stirring with a clean burr-free spatula (flexible plastic) for 1-2 minutes. Care must be taken to avoid air entrapment. Printing should be performed in a clean and well-ventilated area. Note: optimum printing characteristics are generally achieved in the room temperature range of 20°C – 23°C. It is therefore important that the material, in its container, is at this temperature prior to commencement of printing.

Drying

Allow prints to level at room temperature, and then dry in a well-ventilated oven or conveyor dryer.

Firing

Fire in a well ventilated belt, conveyor furnace, or static furnace. Airflows and extraction rates should be optimized to ensure that oxidizing conditions exist within the muffle.

For more information on DuPont LF151 or other DuPont Microcircuit Materials products, please contact your local representative:

Americas

DuPont Microcircuit Materials
14 T.W. Alexander Drive
Research Triangle Park, NC 27709
Tel.: 800-284-3382

Europe

Du Pont (U.K.) Limited
Coldharbour Lane
Bristol BS16 1QD
U.K.
Tel.: 44-117-931-3191

Asia

DuPont Kabushiki Kaisha
DuPont Electronic Center
KSP R&D B213, 2-1, Sakado 3-chome, Takatsu-ku
Kawasaki-shi, Kanagawa, 213-0012
Japan
Tel.: 81-44-820-7575

DuPont Taiwan Ltd
45, Hsing-Pont Road,
Taoyuan, Taiwan 330
Tel.: 886-3-377-3616

DuPont China Holding Co. Ltd
Bldg 11, 399 Keyuan Rd., Zhangji Hi-Tech Park,
Pudong New District, Shanghai 201203, China
Tel.: 86-21-6386-6366 ext.2202

DuPont Korea Inc.
3-5th Floor, Asia tower #726,
Yeoksam-dong, Gangnam-gu
Seoul 135-719, Korea
Tel.: 82-10-6385-5399

E. I. DuPont India Private Limited
7th Floor, Tower C, DLF Cyber Greens,
Sector-25A, DLF City, Phase-III,
Gurgaon 122 002 Haryana, India
Tel.: 91-124-4091818

Du Pont Company (Singapore) Pte Ltd
1 HarbourFront Place, #11-01
HarbourFront Tower One,
Singapore 098633
Tel.: 65-6586-3022

<http://mcm.dupont.com>



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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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