DuPont LL500

Co-fired gold via fill

Technical Data Sheet

Product Description

DuPont LL500 is a gold via fill compatible with the DuPont™ GreenTape™ 9K7 low temperature co-fired ceramic (LTCC) tape material and the gold system's companion co-fired conductor members: DuPont LL505 (internal), DuPont LL507 (external) and DuPont LL509 (solderable). DuPont LL500 is cadmium and lead free*.

Product Benefits

When used as the via fill in the GreenTape™ 9K7 LTCC system, DuPont LL500 offers the following benefits:

- High reliability, high conductivity metallization
- Co-fire processing
- High circuit density
- Cadmium and lead free*

*Cadmium and lead "free" as used herein means that cadmium and lead are not an intentional ingredients in and are not intentionally added to the referenced product. Trace amounts however may be present.

Processing

For detailed recommendations on the use of the DuPont LL500 via fill with the GreenTape™ 9K7 system, consult this data sheet and the DuPont™ GreenTape™ LTCC Design Guide. For compatible co-fired and post fired conductor compositions, consult the DuPont™ GreenTape™ 9K7 Product Selector Guide.

Printing

The composition should be thoroughly stirred prior to use. This is best achieved by a slow, gentle mixing by hand for 1 to 2 minutes using a clean, burr-free spatula (flexible plastic or stainless steel). Care must be taken to avoid air entrapment.

Prior to the via fill step, via openings are formed/ punched in the preconditioned GreenTape™ 9K7 green sheets per the applicable circuit design for the respective layers of the build.

Typical Properties

Property	Value
Viscosity, (Pa.s, 1 rpm, 25° C)[1]	7500 - 9500
Solids, (%)[2]	93.0 - 95.0
Clean-up solvent	1-Propoxy-2-Proponal
Thinner	9450
Via diameter resolution, (um)	100
Resistivity, (mOhms/sq)[3]	</= 5

[1] Brookfield HBT, SC4-14 / 6R spindle and utility cup
[2] 750° C
[3] Normalized to 15 um dry thickness

The above table shows the anticipated typical physical and electrical properties for DuPont LL500 based on specific controlled experiments in our labs and are not intended to represent the product specifications, details of which are available upon request.

Print DuPont LL500 directly into the open vias using typical through-hole screen printing methods and a stencil mask. The use of a vacuum stone or other support structure which uniformly distributes a vacuum across the green sheet is recommended to assist with the uniform and complete filling of the via array patterns, as well as secure the green sheet to the printer's stage plate during the printing process.

Printing should be performed in a clean, well ventilated area. Optimum printing characteristics are generally achieved when the room and paste container temperatures are in the 20 to 23°C range.

Drying

Dry via prints in a well ventilated oven or conveyor dryer for 5 minutes at 100°C. Do not over-dry. An alternative drying method is to allow the DuPont LL500 fills to dry 6 to 8 hours at ambient room temperature.

Lamination

Collate, stack and laminate multiple sheets of the printed circuit patterns according to the recommended processing parameters detailed in the DuPont™ GreenTape™ LTCC Design Guide.

Typical lamination parameters are 3000 psi at 70°C for 10 minutes. Lamination pressures may vary slightly based upon part design and the individual tape lot shrinkage factors.

Firing

Fire in a well ventilated conveyor or static furnace. Air flows and extraction rates should be optimized to ensure that oxidizing conditions exist within the muffle and that no exhaust gases enter the room.

GreenTape™ 9K7 requires the use of dedicated, specially coated setters in order to prevent parts from sticking during firing.

Consult the DuPont™ GreenTape™ 9K7 low temperature co-fired ceramic (LTCC) system data sheets and DuPont™ GreenTape™ LTCC Design Guide for additional details.

For further information regarding firing profiles, furnace recommendations and setter tile choices, please contact your local DuPont™ Technical Service Representative.

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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