

DuPont 5018G

UV CURABLE DIELECTRIC

Technical Data Sheet

Product Description

Polymeric dielectric composition DuPont 5018G is a green UV curable, solvent less, screen printable composition used in encapsulant and crossover applications for both rigid and flexible circuit manufacture. It offers the advantages of rapid cure and excellent processing latitude while maintaining excellent electrical and physical properties after cure, including excellent crosshatch adhesion to print-treated and good adhesion to non-print-treated PET substrate and conductor. It is fully compatible with DuPont's 5000's Series conductor compositions.

Product Benefits

- Best insulating UV cure dielectric

Processing

- **Screen Printing Equipment**
Semiautomatic and manual
- **Substrates**
Polyester, polyimide, epoxy glass
- **Ink Residence Time on Screen**
> 2 hours
- **Screen Types**
Polyester, stainless steel
- **Optimum Cure Conditions for Flexibility**
40 ft/min in air¹
500 - 1500 mJ/cm^{2*}
- **Typical Thickness (after cure) Printed with 200 - 280mesh stainless steel screen**
1– 1.2 mil

Two prints of dielectric are strongly recommended to achieve maximum circuit reliability.

Table 1
Typical Physical Properties and Electrical Properties On Polyester Film

| Test | Properties |
|--|---------------------------------------|
| Adhesion Crosshatch (ASTM D3359-78) Dielectric to Polyester Scotch Tape #600 (B) | No Transfer (5) |
| Conductor to Dielectric | No transfer |
| Abrasion Resistance, Pencil Hardness (ASTM D3363-74)[H] | ≥ 1 |
| Operating Use Temperature (°C) (dependent on conductor) | At least 70 |
| Flexibility (180° crease over DuPont 5007) | No opens |
| Breakdown Voltage, [V/mil DC] (ASTM D150) | ≥ 500 |
| Dielectric Constant [@ 1kHz] (ASTM D150) | 4.4 |
| Insulation Resistance (GΩ/sq/mil) | > 10 |
| Change in Physical Properties after Environmental Tests* | Insignificant |
| Change in Insulation Resistance after Environmental Tests* | May drop up to one order of magnitude |
| <small>* Environmental Tests • Thermal Shock (+85°C to -40°C, 30 min. each, 5 cycles) • Dry Heat (+85°C, 10 days) • Humidity (+40°C, 95% RH, 10 days) [MIL Std 202E, method 103, cond. A] • Salt Spray (+35°C, 5% salt, 10 days) [ASTM B117]</small> | |

Table 1 & 2 show anticipated typical physical properties for DuPont 5018G based on specific controlled experiments in our labs and are not intended to represent the product specifications, details of which are available upon request.

¹RPC Industries "QC" Processor Model 1202 AN, with the 200 W/in medium-pressure mercury vapor lamps. Since cure conditions govern characteristics, customers should establish the cure rate required to produce optimum combination of flexibility and hardness.
*0.500 - 1.500, joules using International Light IL.390B Light Bug or UV Process Supply

**Table 2
Composition Properties**

| Test | Properties |
|---|------------------|
| Viscosity (Pa.s) (Brookfield ½RVT, 10 rpm, #14 spindle, 25°C) | 15 - 30 |
| Solids (150°C) (%) | 100 |
| Coverage (cm²/g) (Dependent on print thickness) 0.45 mil coating given by 280-mesh polyester | 500 |
| 0.6 mil coating given by 230-mesh polyester | 375 |
| 1.0 mil coating given by 280-mesh stainless steel | 290 |
| 1.1 mil coating given by 200-mesh stainless steel | 240 |
| Thinner | Not recommended |
| Density, g/cm² | 1.28 |
| Color | Green |
| Odor | Slight, pleasant |

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. UV curable compositions such as DuPont 5018G should be stored away from heat and light.

Safety and Handling

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



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