5018G UV Curable Dielectric

Polymer Thick Film Composition

All values reported here are results of experiments in our laboratories intended to illustrate product performance potential with a given experimental design. They are not intended to represent the product's specifications.

Product Description

Polymeric dielectric composition 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, polymide, epoxy glass
- **Ink Residence Time on Screen**
  > 2 hours
- **Screen Types**
  Polyester, stainless steel
- **Optimum Cure Conditions for Flexibility**
  40 ft/min in air[1]
  500 - 1500 mJ/cm²*
- **Typical Thickness (after cure) Printed with 200 - 400mesh stainless steel screen**
  1– 1.2 mil

[1]RPC 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 1
Typical Physical Properties and Electrical Properties On Polyester Film

Adhesion Crosshatch (ASTM D3359-78)	
Dielectric to Polyester Scotch Tape #810	No transfer (5B)
Conductor to Dielectric	No transfer
Abrasion Resistance, Pencil Hardness (ASTM D3363-74)	≥ 1H
Operating Use Temperature (°C) (dependent on conductor)	At least 70
Flexibility (180° crease over 5007)	No opens
Breakdown Voltage (ASTM D150)	≥ 500 V/mil DC
Dielectric Constant (ASTM D150)	<5 at 1 kHz
Insulation Resistance	>10 GΩ/sq/mil
Change in Physical Properties after Environmental Tests*	Insignificant
Change in Insulation Resistance after Environmental Tests*	May drop up to one order of magnitude

* 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]

Storage and Shelf Life

DuPont thick film polymeric compositions should be stored at ambient temperatures. The shelf life of material in unopened containers is a minimum of six months from date of shipment. UV curable compositions such as 5018G should be stored away from heat and light.

Table 2 Composition Properties	
Viscosity (Pa.s) (Brookfield ½RVT, 10 rpm, #14 spindle, 25°C)	15 - 30
Solids (150°C) (%)	100
Coverage (cm^2/g) (Dependent on screen size and material)	
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/cm^3	1.28
Color	Green
Odor	Slight, pleasant

Safety and Handling

This product contains organic solvent and materials. The following precautions should be exercised when handling 5018G:

- Use with adequate ventilation
- Avoid prolonged contact with skin.
- If contact with skin occurs, wash affected area immediately with soap and water
- Avoid prolonged breathing of vapor
- Dangerous is swallowed - DO NOT CONSUME
- Refer to MSDS for more details

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