DuPont 5018A

UV CURABLE DIELECTRIC

Technical Data Sheet

Product Description

Polymeric dielectric composition DuPont 5018A is a colorless 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 air[1]
  500 - 1500 mJ/cm²*
- **Typical Thickness (after cure) Printed with 200 - 280 mesh stainless steel screen**
  1– 1.2 mil

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

[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 Con-Trol-Cure® Compact Radiometer, or 0.100 - 0.300 joules, using Electronic Instrumentation & Technology Inc. UR 365 CHI Radiometer

Table 1
Typical Physical Properties

Test	Properties
Adhesion Crosshatch (B) (ASTM D3359-78) Dielectric to Polyester Scotch Tape #600	No transfer (5)
Conductor to Dielectric	No transfer
Abrasion Resistance, Pencil Hardness (H) (ASTM D3363-74)	≥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 (at 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

* 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]

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

Table 2
Composition Properties

Test	Properties
Viscosity (Pa.s) (Brookfield ½RVT, 10 rpm, #14 spindle, 25°C)	15 - 30
Solids (150ºC) (%)	100
Coverage (cm²/g) (Dependent on print thickness) 0.45 mil coating given by 280-mesh polyester 0.6 mil coating given by 230-mesh polyester 1.0 mil coating given by 280-mesh stainless steel 1.1 mil coating given by 200-mesh stainless steel	 500 375 290 240
Thinner	Not recommended
Density, g/cm^3	1.28
Color	Colorless
Odor	Slight, pleasant

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 DuPont 5018A 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).

For more information on DuPont 5018A 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
Sanno Park Tower, 11-1
Nagata-cho 2-chome
Chiyoda-ku, Tokyo 100-611
Japan
Tel.: 81-3-5521-8650

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
HarbourFrong Tower One,
Singapore 098633
Tel.: 65-6586-3022

http://mcm.dupont.com

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