



DuPont Electronic Materials

# 5000 Polymer Silver Conductor

## Polymer Thick Film Composition / Preliminary Data Sheet

### Product Description

5000 is a general purpose polymer thick film silver-containing conductor for use on polyester. Using a unique combination of silver powder and resin technologies, 5000 possesses excellent conductivity, abrasion resistance, and printability. 5000 is compatible with 7102 (overcoat carbon) and 5018 UV dielectric

### Processing

- Screen Printing Equipment**  
Reel-to-reel, semi-automatic, manual
- Substrates**  
Print-treated or non-print treated polyester
- Ink residence Time on Screen**  
> 2 hours
- Screen Types**  
77T polyester or 280 mesh stainless steel (SS)
- Typical Cure Conditions**  
Box Oven: 120°C for 10 mins  
IR 130°C for 2 mins  
Reel-to-reel: 140°C for 60 secs.
- Typical Circuit Line Thickness**  
Printed With Polyester 77T Mesh  
8 µm
- Clean-up Solvent**  
Methyl propanol acetate/ Ethylene diacetate (50/50 mix)

### Compatibility

Whilst DuPont has tested this composition with specified materials and under the recommended processing conditions, it is impossible or impractical to cover every combination of materials, customer processing conditions and circuit layout.

It is therefore essential that customers thoroughly evaluate this material in their specific situations, in order to completely satisfy themselves as to the overall quality and suitability of the composition for their intended application(s).

**Table 1**  
**Typical Composition Properties**

|                       |           |
|-----------------------|-----------|
| <b>Viscosity</b>      |           |
| Brookfield RVT        | 8-16 Pa.s |
| Utility cup & spindle |           |
| SC4-14/6R @10 rpm     |           |
| 25°C ± 0.2°C          |           |
| <b>Thinner</b>        | 8260      |

**Table 2**  
**Typical Physical Properties**  
**on 125 µm Polyester Film**  
(Dependent on processing conditions)

|  |                       |
|--|-----------------------|
| <b>Normalised Resistivity (m /sq/25µm)</b> |                       |
| (IR Cure/130°C/2 min.)                     | 8-10                  |
| (Forced Air/120°C/10 min)                  | 10-14                 |
| <b>Adhesion</b>                            |                       |
| (ASTM X Hatch Test)                        | 5B                    |
|  | (no material removal) |
| <b>Abrasion Resistance</b>                 |                       |
| (ASTM Pencil Hardness)                     | 5H                    |
| <b>Crease Resistivity</b>                  |                       |
| (180 Degree Crease)                        | >4 Creases to open    |

### Thinner

5000 polymeric silver conductor is optimised for screen printing and thinning is not normally required, although 8260 may be used sparingly for slight adjustments to viscosity or to replace evaporation losses.

However, the use of too much thinner or the use of a non-recommended thinner may affect the rheological behaviour of the material and its printing characteristics.

### Storage

Containers of 5000 polymeric silver conductor may be stored in a clean, stable environment at room temperature (<25°C), with their lids

tightly sealed. Storage in freezers (temperature <0°C) is NOT recommended, as this could cause irreversible changes in the material.

Jar rolling is unnecessary and is NOT recommended, as this could change the rheology of the material.

## Shelf life

5000 polymeric silver conductor has a shelf life of 6 months from date of shipment, for factory-sealed (unopened) containers, stored under room temperature conditions.

## Printing

5000 polymeric silver conductor should be thoroughly mixed before use. This is best achieved by slow, gentle hand stirring with a clean, burr-free spatula (flexible plastic or stainless steel) for 1-2 minutes.

Printing should be carried out in a clean, well-ventilated area. Additional information on requirements for printing areas is contained in DuPont Technical Guide, EUT 7.3 "Processing-Screen Printing Rooms", available on request.

*Note:* optimum printing characteristics of 5000 polymeric silver conductor are generally achieved in the

temperature range 20°C-23°C. It is therefore important that the material, in its container, is at this temperature prior to commencement of printing.

## General

Yields and performances will depend to a large degree on the care exercised during processing, particularly in screen printing.

Scrupulous care should be taken to keep the polymeric composition, printing screens and other tools free of metal contamination.

Dust, lint and other particulate matter may also contribute to poor yields.

## Health/Safety considerations

DuPont polymer compositions are intended for use in an industrial environment by trained personnel. All appropriate health/safety regulations regarding storage, handling and processing of such materials should be complied with.

For information on health/safety regulations, please refer to the specific MSDS for 5000 polymeric silver conductor and to the DuPont Safety Guide EUT 7.1 "Practical Safe Handling of Thick Film Compositions".

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