

# DuPont™ Solamet® PV414

## photovoltaic metallizations

### Technical Data Sheet

#### Product Description

DuPont™ Solamet® PV414 photovoltaic metallization paste is a silver based polymer composition. It is designed for Rotary Printing for use as a FS conductor in CIGS, a-Si and other thin film solar cells.

#### Product Benefits

- Low grid line resistance (R<sub>gl</sub>)
- Low contact resistance (R<sub>c</sub>) to ITO and other TCO's
- Excellent printability and fine line capability
- Excellent adhesion to TCO

#### Processing Summary

- **Printing Equipment**  
Rotary Printing (reel-to-reel)
- **Substrates**  
Flexible with sputter coated TCO
- **Screen Type**  
RotaMesh SP 190 or similar
- **Typical Drying Conditions**  
Substrate/cell dependent,  
150–180°C/5 min
- **Typical Circuit Line Thickness**  
8µm for 150µm track width
- **Clean-up Solvent**  
Ethylene Glycol diacetate or Methyl propyl acetate

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, details of which are available upon demand.

**Table 1**  
**Typical Composition and Physical Properties**

Solids (%) at 750°C	73–78
Viscosity (Pa.s.) (Brookfield 1/2 RVT, spindle #14, 10rpm)	18–30
Thinner	8260
Resistivity (mΩ/sq/25µm)	8–12
Coverage (cm <sup>2</sup> /g) (150µm track width, 8µm thickness)	~220
Abrasion Resistance (ASTM Pencil Hardness)	2H

#### Paste Preparation

The composition should be thoroughly mixed before use. This is best achieved by slow, gentle hand stirring with a clean burr-free spatula (flexible plastic) for 1–2 minutes. Jar rolling is NOT recommended, as this could change the rheology of the material. Care should be taken to avoid air entrapment.

#### Drying

Depending on the temperature tolerance of the cell and substrate, Solamet® PV414 can be dried at temperatures between 150°C and 180°C. Drying times can vary depending on the efficiency of the drier. Longer drying times and higher drying temperatures will improve the adhesion, resistivity and abrasion resistance.



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## **Printing**

Printing should be carried out in a clean, well-ventilated area. DuPont™ Solamet® PV414 photovoltaic composition, in its container, should be at ambient temperature prior to commencement of printing.

## **Thinner**

This composition is optimized for screen printing, thinning is not normally required. Use the DuPont recommended thinner for slight adjustments to viscosity or to replace evaporation losses. The use of too much thinner or the use of a non recommended thinner may affect the rheological behavior of the material and its printing characteristics. Refer to the table.

## **Storage and Shelf Life**

Containers may be stored in a clean, stable environment at room temperature (between 5°C–30°C), with their lids tightly sealed. Storage in high temperature (>30°C) or in freezers (temperature < 0°C) is NOT recommended as this could cause irreversible changes in the material. The shelf life of compositions in factory-sealed (unopened) containers between (5°C–30°C) conditions is 6 months from date of shipment.

## **Safety and Handling**

For information on health and safety regulations please refer to the specific product MSDS.

For more information on DuPont™ Solamet® PV414 photovoltaic metallizations or other DuPont Microcircuit Materials, please contact your local representative:

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