DuPont™ Solamet® PV506

photovoltaic metallization

Technical Data Sheet

Product Description

DuPont™ Solamet® PV506 photovoltaic metallization is a highly conductive solerable silver composition, developed to provide excellent adhesion when used in conjunction with back side aluminum compositions. This paste may be co-fired with front side (n-type) silver conductors such as DuPont™ Solamet® PV16X and Solamet® PV17X and with back side (p-type) aluminum conductors such as DuPont™ Solamet® PV3XX.

Product Benefits

- Excellent adhesion
- Low consumption
- Solderable silver back conductor
- Co-fire with front side silver and back side aluminum
- Efficient utilization of silver
- Good printing characteristics
- Excellent contact with silicon
- Lead and cadmium free*

*Lead and cadmium 'free' as used herein means that lead or cadmium are not an intentional ingredient in and are not intentionally added to the reference product. Trace amounts however may be present.

Processing Summary

- **Application**
  Standard screen print process
- **Printing**
  Speed 6–8 in/sec (150–250 mm/sec)
- **Drying**
  Vertical Dryer 170–230°C 10 minutes
  IR Belt Dryer 220–270°C 30 seconds
  Flexible in accordance with industry practice. Actual settings to be determined by dryer type
- **Screen Type**
  250–325 mesh stainless steel with 10–14 µm emulsion build up
- **Typical Line Thickness**
  6–10 µm
- **Soldering**
  Compatible with industry standard material and condition
  Flux type: non-clean, reactivity level L0/M0 (Standard: ANSI/J-STD-004)
  Ribbon: compatible with Pb contained and Pb free solder material, i.e. 60Sn/40Pb, 62Sn/36Pb/2Ag, 96.5Sn/3.5Ag

Table 1: Typical Physical Properties

Viscosity (Pa·s) (Brookfield RVT, SC4-14/6R @ 10 rpm, 25°C)	75–135
Solids (%) at 750°C	65.5–67.5
Fineness of Grind (4th/50%)	<18 µm/<6 µm
Thinner	8250
Shelf Life (months)	6

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.

DUPONT®

The miracles of science™

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 0.5–1 minutes. Jar rolling is NOT recommended, as this could change the rheology of the material. Care should be taken to avoid air entrapment.

Printing

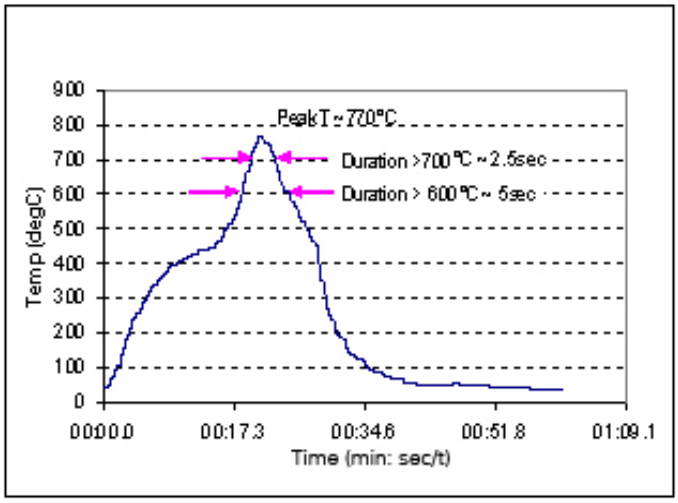
Printing should be carried out in a clean, well-ventilated area. DuPont™ Solamet® PV506 photovoltaic composition, in its container, should be at ambient temperature prior to commencement of printing.

Firing

Solamet® PV506 is designed for rapid (spike) firing. Thermal budget above 600°C should be kept to minimum, ideally <8 seconds to ensure optimum electrical contact to the wafer. See **Chart 1** for typical firing profile. Actual furnace settings and belt speed will depend on the wafer thickness, texturing and emitter resistivity as these influence the temperature of the wafer during firing.

It is important that wafers are fired in a well ventilated furnace, with a continuous supply of clean filtered air. Airflow and extraction rates should be optimized to ensure that oxidizing conditions exist within the furnace firing chamber, especially when front and backside conductors are co-fired.

Chart 1
Typical Firing Profile



Thinner

Solamet® PV506 composition is optimized for screen printing and 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. Please refer to **Table 1**.

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 (<30°C) 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® PV506 photovoltaic metallization or other DuPont Microcircuit Materials, please contact your local representative:

Americas

DuPont Microcircuit Materials
14 TW Alexander Drive
Research Triangle Park, NC 27709
USA
Tel +1 800 284 3382 (calls within USA)
Tel +1 919 248 5188 (calls outside USA)

Europe, Middle East & Africa

Du Pont (UK) Ltd
Coldharbour Lane
Bristol BS16 1QD
UK
Tel +44 117 931 3191

Asia

Du Pont Kubushiki Kaisha
Sanno Park Tower, 11-1
Nagata-cho, 2-chome
Chiyoda-ku, Tokyo, 100-611
Japan
Tel +81 3 5521 8650

DuPont Taiwan Limited
45, Hsing-pont Road
Taoyuan, 330
Taiwan
Tel +886 3 377 3616

DuPont China Holding Company Ltd
Bldg. 11, 399 Keyuan Road
Zhangjiang Hi-Tech Park
Pudong New District
Shanghai 201203
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 +91 124 409 1818

Du Pont Company (Singapore) Pte Ltd
1 HarbourFront Place, #11-01
HarbourFront Tower One
Singapore 098633
Tel +65 6586 3022

http://mcm.dupont.com
http://photovoltaics.dupont.com

K25754_Ltr 03/2012

DUPONT®

The miracles of science™