

DUPONT™ SOLAMET® PV56S

TECHNICAL DATA SHEET

PRODUCT DESCRIPTION

DuPont™ Solamet® PV56S photovoltaic metallization back side paste is a highly conductive solderable silver composition, developed to lower consumption yet providing excellent adhesion to SiNx on localized back surface field cells.

This paste is also designed to enable high Voc by reducing charge carrier recombination in passivation layer when used in conjunction with back side aluminum compositions. Solamet® PV56S is able to co-fire with front side (n-type) silver conductors such as DuPont™ Solamet® PV17x, PV18x and with back side (p-type) aluminum conductors such as DuPont™ Solamet® PV36x.

PRODUCT BENEFIT

- Non fire-through capability
- High adhesion with low consumption
- Co-fireable with front side silver and back side aluminum
- Cadmium free*

*Cadmium 'free' as used herein means that cadmium is not an intentional ingredient in and is not intentionally added to the referenced product. Trace amounts however may be present.

PROCESSING SUMMARY

- **Application**
Standard screen print process
- **Printing**
Speed 180–250 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**
200 or 250 mesh stainless steel is recommended
- **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 HADV, SC4-14/6R @ 10 rpm, 25°C)	50–100
Solids (%) at 750°C	59–61
Fineness of Grind (4 th /50%)	<12 µm/<6 µm
Thinner	9450
Shelf Life (months)	6

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® PV56S photovoltaic composition, in its container, should be at ambient temperature prior to commencement of printing.

FIRING

Solamet® PV56S 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.



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THINNER

Solamet® PV56S 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**.

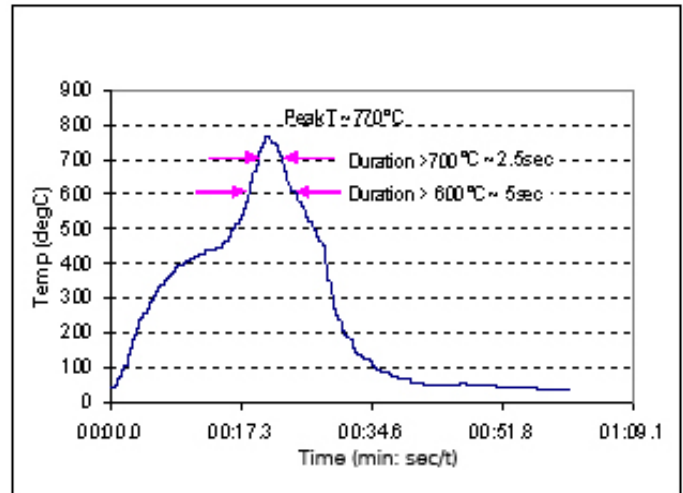
STORAGE

Containers may be stored in a clean, stable environment at room temperature (between 5°C–25°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.

SAFETY AND HANDLING

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

CHART 1
TYPICAL FIRING PROFILE



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