

# DuPont™ Solamet® PV361

## photovoltaic metallizations

### Preliminary Technical Data Sheet

#### Product Description

DuPont™ Solamet® PV361 photovoltaic metallization paste is a high performance conductive aluminum composition, developed as a back surface conductor compatible with the Laser Fired Contact (LFC) process for Local Back Surface Field (Local BSF) designs of silicon solar cells. This paste may be cofired with standard DuPont™ Solamet® front side silver such as DuPont™ Solamet® PV16X or PV17X series, as well as tabbing Ag back side conductors such as DuPont™ Solamet® PV5XX series. It can also be used in combination with the DuPont™ Solamet® PV701 Ag and tabbing conductor in the Metal Wrap Through (MWT) cell design. It is designed for rapid and very fast (spike) firing.

#### Product Benefits

- Developed for Laser Fired Contact (LFC) process
- Very good local BSF formation with minimum voiding
- High adhesion on passivation layer ( $\text{SiO}_2/\text{SiN}_x$ ,  $\text{Al}_2\text{O}_3/\text{SiN}_x$  stacks) with no dielectric damage (not designed to be used as a back plane on non passivated silicon)
- Fast drying and firing
- Low electrical resistivity after firing
- Compatible with PV701 Ag for Metal Wrap Through (MWT) cell design
- Lead and Cadmium free\*

\*Lead and Cadmium 'free' as used herein means that lead or cadmium are not intentionally added to the referenced product. Trace amounts however may be present.

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.

#### Processing Summary

- **Application**  
Standard screen print process
- **Screen Type**  
200–250 mesh stainless steel with 10–14 $\mu\text{m}$  emulsion build up
- **Printing**  
Speed 6–8 in/sec (150–220 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
- **Soldering**  
Not solderable

#### 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.

#### Printing

Printing should be carried out in a clean, well-ventilated area. DuPont™ Solamet® PV361 photovoltaic composition, in its container, should be at ambient temperature prior to commencement of printing.

#### Firing

DuPont™ Solamet® PV361 photovoltaic metallization 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.



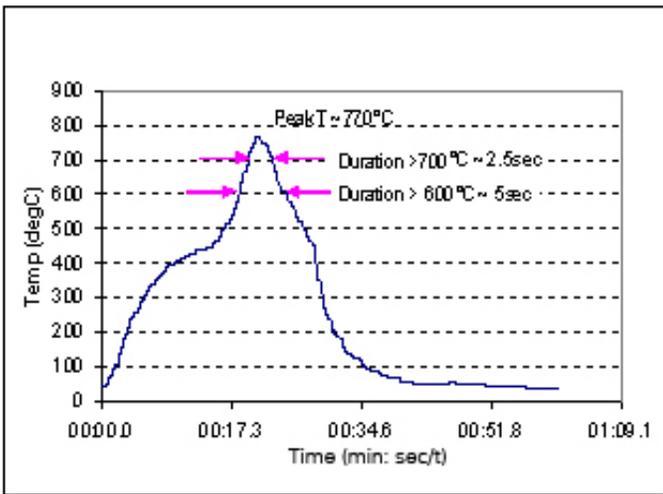
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See **Chart 1** for typical firing profile.

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 cofired.

**Chart 1**  
**Typical Firing Profile**



## Thinner

DuPont™ Solamet® PV361 photovoltaic metallization composition is optimized for screen printing and thinning is not normally required. Use the DuPont 4553 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.

## 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) is 6 months from date of shipment.

## Safety and Handling

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

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