

## SOL9360A Series

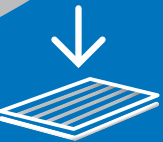


SOL9360A  
> +0.1 %  
Eta gain

*efficiency*

Patent Pending

N-TYPE FRONT-SIDE PASTE



### New Generation N-type Front Side Paste

- Improved contact
- Fine line printing
- Single and double printing application

As N-type cell has drawn much attention as another avenue to high efficiency c-Si solar cell, designs have demonstrated high efficiencies for cell manufactures and Heraeus has supported this effort for over three years with the development and mass production of our SOL9350 series pastes. Heraeus continues to innovate through investments in R&D and has developed pastes with greater performance for n-type cells.

The Heraeus SOL9360A is our newest n-type paste for p+ wafer surfaces. In conjunction with our pastes for n+ wafer surfaces, beta test customers have demonstrated higher cell efficiencies with 20% less paste usage per cell. This translates into a significant reduction in a cell's cost per watt.

Please contact our local technical service teams for details progress recommendations.

#### KEY BENEFITS

- Customer confirmed > +0.1% efficiency gain
- Improved printability/line uniformity
- Finer line resolution
- Co-fireable with Heraeus n<sup>+</sup>-surface paste
- A+B mode double printing packages (SOL9360A/SOL9622B) available

## HIGHER CELL PERFORMANCE

Heraeus' SOL9360A Series is our newest front-side metallization pastes for n-type cell designs with p<sup>+</sup> wafer surfaces. The performance of this series of pastes is an improvement over our industry leading SOL9350 Series, which has been in mass production for over three years for n-type cell designs. Test results show that SOL9360A Series has significant improvement in cell efficiency (> +0.1%) and other electrical characteristics relative to SOL9350C.

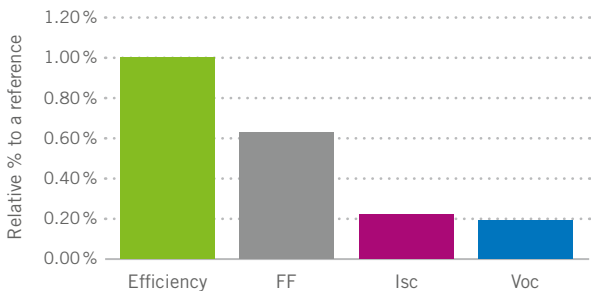


Figure 1: SOL9360A – Improved Characteristics

## IMPROVED PRINTABILITY

Beyond the electrical performance, the SOL9360A Series has improved printability over the SOL9350 Series. The SOL9360A Series of pastes allow for excellent flooding and low bleed out. These features give the ability for finer line resolution with improved line uniformity and higher aspect ratio. In combination with the excellent contacting properties, overall cell performance is increased over the previous generation of paste.

	Ref.	Ref.	SOL9360A
Top View			
EL			
Finger Opening (µm)	50	29	29
EL	Acceptable	Poor	Good
Avg H (µm)	10.8	11.5	12.2
Avg W (µm)	80.6	46.9	44.15

## TYPICAL PROPERTIES

### Wafer types:

- Monocrystalline n-type

### Recommended finger opening:

Single Print: 28–45 µm

Double Print: to be optimized based on customer case

**Solid content:** 90.00 ± 1.0%

### Fineness of Grind (FOG):

- 4th scratch: ≤ 10 µm
- 50%: ≤ 5 µm

### Viscosity:

**SOL9360A:** CPE-51 spindle (Brookfield):

80–140 kcps at 1 RPM, 25°C

## RECOMMEND PROCESSING GUIDING PRINTING

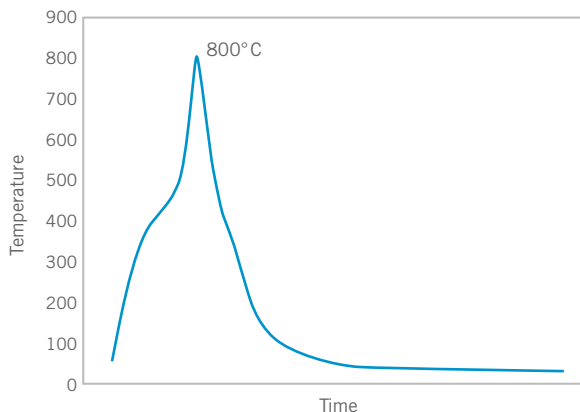
**Printing:** Screen parameter recommendations with stainless steel screen:

≥ 28–45 µm opening:

- calendared 360 mesh, 16 µm or
- calendared 430 mesh, 13 µm or
- calendared 325 mesh, 16 µm
- EOM thickness: 12–20 µm

**Drying:** Typically dried in an IR dryer with set points of 250–300°C in less than 30 seconds or 150–200°C for 10 minutes in circulated air oven.

### Firing:



### Storage:

Store in a dry location at room temperature.

Stir well before using.

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