

SOL9631 Series

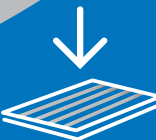


SOL9631C
 $> +0.2\%$
 eta gain

efficiency

Patent Pending

FRONT-SIDE PASTE



New Generation PERC Front-Side Silver Paste

- Ideal for both PERC and BSF standard cells

The SOL9631 Series has been developed based on our brand-new glass chemistry, combined with the latest breakthrough in organic vehicle system for ultra-fine-line printing. As confirmed by customers SOL9631 Series has outstanding LID (Light Induced Degradation) performance and improved reliability for both cells and modules.

SOL9631B has a wide firing window and can be fired at low temperatures, which makes the paste specifically suitable for the application on PERC (Passivated Emitter Rear Contact) solar cells. At the same time, the paste shows excellent performance at regular firing temperatures. The paste is specifically strong in the feature of adhesion.

SOL9631C excels through excellent printability and high aspect ratio. The superior line shape and unique glass frit allow to achieve a low grid resistance and outstanding efficiencies.

Please contact our local technical service teams for detailed process recommendations.

KEY BENEFITS

- For outstanding efficiency gains
- Exclusive in-house glass chemistry and vehicle system
- Anti Light-Induced-Degradation
- Improved cell and module reliability
- Ultra-fine-line-printing for mass production

LOW TEMPERATURE FIRING FOR PERC-SOLAR CELLS

The SOL9631 series features a unique glass chemistry, in which >45 years of experience and expertise in glass development for the thick film paste industry are incorporated. This key ingredient, exclusively developed and manufactured by Heraeus, enables the tolerance of low firing temperatures. After low temperature firing the microstructure of the fired finger shows a much more densified structure including the Ag-Silicon interface, enhancing adhesion, grid resistivity and solderability. Beyond significantly improving the reliability performance of PERC-solar cells and the later module, light-introduced-degradation loss is reduced to be similar as a normal P-type module.

The SOL9631 series is perfectly tailored for Ultra-fine-line printability for screen printing. It supports a finger geometry that can print defect-free through a less than 30 µm screen opening in high throughput mass production, resulting in an efficiency gain through reduced optical shading and less contact area.

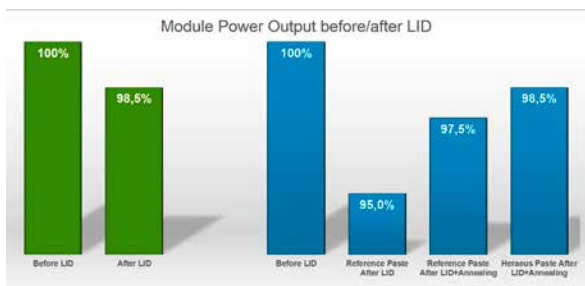


Figure 1: Comparison of power output of regular mc (green) and mc PERC (blue) module before and after LID.

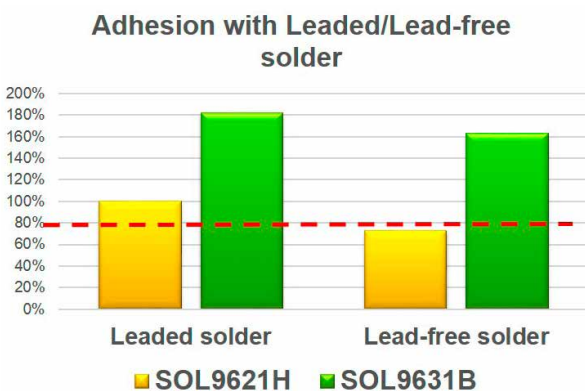


Figure 2: Comparison of peel force with Leaded/Lead-free solder.

TYPICAL PROPERTIES

Wafer types:

- Monocrystalline
- Multicrystalline

Recommended finger opening: 28–45 µm

Solid content:

SOL9631B: 90.90 ± 1.0%
SOL9631C: 91.00 ± 1.0%

Fineness of Grind (FOG):

- 4th scratch: ≤ 10 µm
- 50%: ≤ 5 µm

Viscosity:

SOL9631B: CPE-51 spindle (Brookfield):
145–265 kcps at 1 RPM, 25°C
SOL9631C: CPE-51 spindle (Brookfield):
50–140 kcps at 1 RPM, 25°C

RECOMMENDED PROCESSING GUIDELINES PRINTING

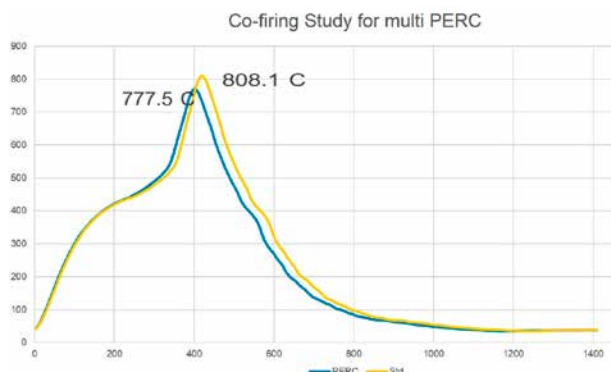
Printing: Screen parameter recommendations with stainless steel screen:

- ≥ 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:



Note: The above firing profile is a standardized recommendation. For a profile optimized to your process, please contact your Heraeus Technical Service representative.

Storage:

DO NOT REFRIGERATE.

Store in a dry location at 5°C–25°C. Allow paste to come to room temperature prior to opening. Spatulate well before using.

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