

SOL9641B Series

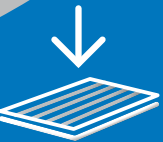


SOL9641B
> +0.2 %
Eta gain

efficiency

Patent Pending

FRONT-SIDE PASTE



New Generation Front Side Silver Paste

- Superior metallization contact on ULDE mono and PERC cells
- Ultra-fine printed finger
- Double & Dual printing package available for efficiency boost

Heraeus, the technology leader, developed the SOL9641B series based on the brand-new glass chemistry for ULDE (Ultra Lightly Doped Emitter), combined with the latest improvement in organic vehicle system for UFL (ultra-fine-line) printing. As confirmed by customers, SOL9641B has superior metallization contact on ULDE mono and multi crystalline solar cells.

SOL9641B is a revolutionary design as a “Product Platform”, not just a product family. Such unique paste chemistry has a wide firing window toward lower temperature side, which makes this series well-performed on PERC (Passivated Emitter Rear Contact) solar cells. It is worth mentioning that the 9641B formulation design strategy also allows our local PML (Product Modification Labs) to do quick and efficient customization for versatile applications and customer requests.

Please contact our local technical service teams for details.

KEY BENEFITS

- Outstanding efficiency gain on ULDE through well-balanced Voc and contact
- Ultra-fine-line (UFL) screen printing for defect-free mass production
- Wide process window
- Great CTM (cell-to-module) performance
- Allows quick and efficient customization
- Double and Dual printing packages available
A+A' : SOL9641B1/SOL9641B2
A+B : SOL9641B/SOL9622B

UNIQUE PASTE CHEMISTRY FORMS SUPERIOR OHMIC CONTACT ON ULDE

Continued innovation from SOL9641A, 9641B features a unique paste chemistry from the breakthrough of new materials development. Among them, the patent pending glass frit in 9641B, enabling the tolerance of wide firing temperatures, is exclusively developed and manufactured by Heraeus.

Driven by ULDE in c-Si solar industry, SOL9641B successfully overcome the challenge of contacting phosphor-doped cell surface as low as 10^{-19} dopant concentration. From the deep understanding of micro-structure study, such paste chemistry has well-balanced metallization contact and passivation damage. The superior contact resistivity (ρ_c) could bring out the most benefits of ULDE, such as higher I_{sc} and V_{oc} , therefore boosts the cell efficiency.

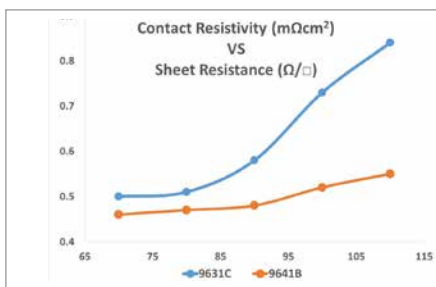


Figure 1: 9641B shows superior contact resistivity while increasing sheet resistance of ULDE

Further improved Ultra-Fine-line printability

The SOL9641B 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 $30\ \mu\text{m}$ screen opening in high throughput mass production, resulting in an efficiency gain through reduced optical shading and less contact area.

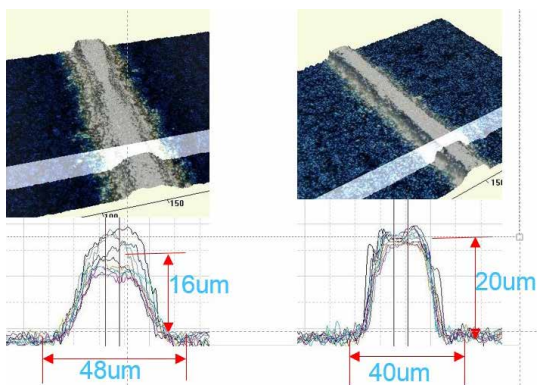


Figure 2: 9641B (right side) has finer and higher fired finger over a reference (left side).

TYPICAL PROPERTIES

Wafer types:

- Monocrystalline with ULDE
- Multicrystalline with ULDE

Recommended finger opening:

Single Print: $25\text{--}45\ \mu\text{m}$
Double Print: can be optimized based on customer case

Solid content: $91.00 \pm 1.0\%$

Fineness of Grind (FOG):

- 4th scratch: $\leq 10\ \mu\text{m}$
- 50%: $\leq 5\ \mu\text{m}$

Viscosity:

SOL9641B: CPE-51 spindle (Brookfield):

$50\text{--}140\ \text{kcps}$ at 1 RPM, 25°C

RECOMMEND PROCESSING GUIDING PRINTING

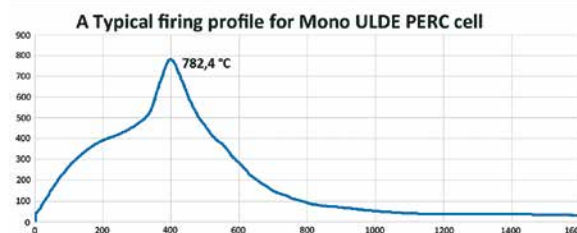
Printing: screen parameter recommended:

$\geq 25\text{--}45\ \mu\text{m}$ opening:

- calendared 360 mesh, $16\ \mu\text{m}$ or
- calendared 430 mesh, $13\ \mu\text{m}$ or
- calendared 325 mesh, $16\ \mu\text{m}$
- EOM thickness: $12\text{--}20\ \mu\text{m}$

Drying: Typically dried in an IR dryer with set points of $250\text{--}300^\circ\text{C}$ in less than 30 seconds or $150\text{--}200^\circ\text{C}$ for 10 minutes in circulated air oven.

Firing:



Storage:

Store in a dry location at $5^\circ\text{C}\text{--}25^\circ\text{C}$. Stir well before using.

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