

SOL9651B2



SOL9651B2
> + 0.15 %
 Eta gain

efficiency

Patent Pending

PERC FRONT-SIDE PASTE



New Generation Front Side Silver Paste

- Specially designed paste for “Stack Passivation” PERC cell
- High FF, excellent fine-line printability for better efficiency
- Dual and double printing package available for efficiency boost

As different passivation technologies were matured in PERC process, such as PECVD (Plasma Enhanced Chemical Vapor Deposition) and ALD (Atomic Layer Deposition), the Alumina oxide and Silicon nitride layers are intentionally (double passivation) or unintentionally (wrap-deposition) stacked on the front-side of silicon solar cell. This has given FS paste more challenges.

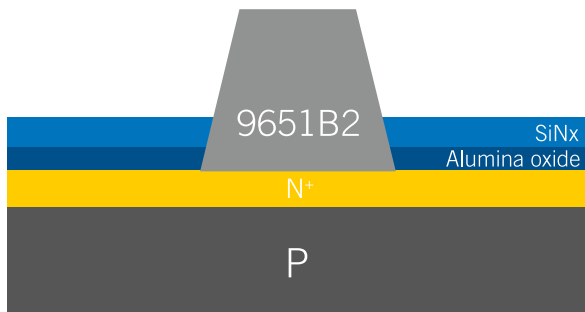
Heraeus, the technology leader, closely following the industry trend, has developed the SOL9651B2 series based on the paste chemistry specially designed for stack passivation PERC cell; As confirmed by customers, SOL9651B2 dual printing and double printing packages provide efficiency gain >0.15% in mass production. Such paste chemistry provides a wide firing window toward lower temperature side, which makes this series well-performed on PERC cell.

KEY BENEFITS

- High FF, superior contact performance on stack passivation solar cell
- Ultra-fine-line (UFL) screen printing for defect-free mass production
- Wide process window
- Allows quick and efficient customization
- Double and Dual printing packages available
 A+A': SOL9652B packages
 A+B: SOL9651B2/SOL9622B

UNIQUE PASTE CHEMISTRY DESIGNED FOR STACK PASSIVATION PERC CELL

Continued innovation from last generation, SOL9651B2 features a unique patent pending glass frit and silver combination, enabling penetration of stack passivation layers. SOL9651B2 also successfully overcome the challenge of contacting ULDE (~ 10⁻¹⁹ dopant concentration) and also ensure the less passivation damages. Such features bring out the most benefits of ULDE, such as higher FF and Voc, therefore boosts the PERC cell efficiency.



FURTHER IMPROVED ULTRA-FINE-LINE PRINTABILITY

The SOL9651B2 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 28µm screen opening in high throughput mass production in single, or dual printing.

Wafer	PERC Mono with ALD Stack Passivation	
Screen	360 Mesh-33 µm Opening	
Paste	Name	9651B2
Screen Printing	Deposit/Pcs	+ 1 mg
	ΔFired L.W.	- 4 µm
	ΔFired L.H.	+ 5 µm
	ΔFired A.R.	+ 7 %
	ΔPrint speed [mm/s]	same
Electrical Performance	ΔEff [%]	+0.17 %
	ΔVoc [mV]	+0.3
	ΔIsc [mA]	+28
	ΔFF [%]	+0.06
	ΔRs [mΩ]	-0.08
	ΔRsh [Ω]	+300

TYPICAL PROPERTIES

Solids: 91.00±1.0%

Viscosity:

SOL9651B2:

- CPE-51 spindle (Brookfield):
80–150kcps @ 1 RPM, 25°C

Fineness of Grind (FOG):

10µm

5µm

Wafer Types:

- Monocrystalline PERC with stack passivation
- Multicrystalline by Diamond-Wire-Cut with stack passivation

Recommended finger opening:

Single Print: 25–40µm

Double Print: can be optimized based on customer case

RECOMMENDED PROCESSING GUIDELINES

Printing: screen parameter recommended:

25–45µm opening:

calendared 360 mesh, 16µm or

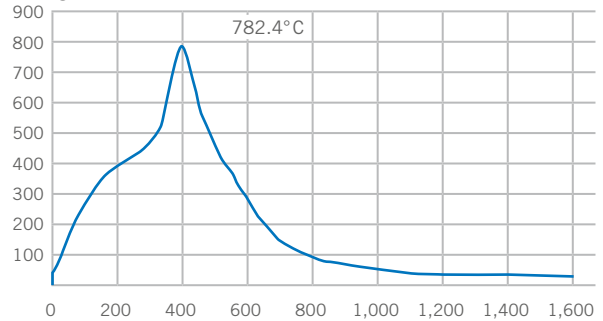
calendared 440 mesh, 13µm or

calendared 325 mesh, 16µm

- EOM thickness: 12–20µm

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:



A typical firing profile for Mono ULDE PERC cell

Storage:

Store in a dry location at 5°C–25°C.

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