

SOL9641AX/BX Series



SOL9641AX/BX
 > +0.1 %
 Eta gain

efficiency

Patent Pending

FRONT-SIDE PASTE



Front Side Silver Paste for “Knotless Screen”

- Built on versatile paste platforms
- For both single and dual printing applications

The SOL9641AX and SOL9641BX have been built on two product platforms 9641A and 9641B with the latest breakthrough in organic vehicle system designed for “Knotless Screen” with finer fingers than printing through conventional screen. As confirmed by customers, both 9641AX and 9641BX have outstanding efficiency gain by only switching screens, which gives great cost advantage.

In close collaboration with screen vendors and customers, Heraeus R&D and engineering team successfully optimized the paste formulation for “Knotless Screen”. Comparing to conventional paste, 9641AX and 9641BX could achieve much better aspect ratio (AR) for fired fingers (0.3 AR VS 0.5 AR), which results a gain in Isc and FF, therefore an outstanding efficiency improvement. Other advantages of 9641A, 9641B for PERC cells and Ultra-lightly-doped-emitter were also carried over.

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

KEY BENEFITS

- Outstanding efficiency gain from the latest “Knotless Screen” technology
- Ultra-fine-line (UFL) screen printing for mass production
- Carried all advantages from different platforms
- SOL9641AX suitable for black-silicon with excellent adhesion
- SOL9641BX with wide process window for PERC and Ultra-lightly-doped-emitter
- Easy to be customized for different types of “Knotless Screens” and customer conditions

KNOTLESS SCREEN TECHNOLOGY



Figure 1:

Conventional wire mesh

Knotless wire mesh

Different from the conventional metal wire mesh, the “Knotless Screen” with so-called “zero degree mesh”, can give more room for the silver paste to go through. However, the conventional paste designed for conventional screen usually needs adjustment on its printability.

GREAT ASPECT RATIO THROUGH KNOTLESS SCREEN

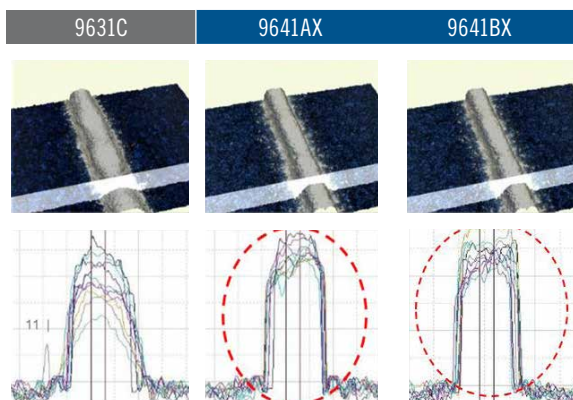


Figure 2: 9641AX and 9641BX have nice Aspect Ratio by „Knotless Screen” printing.

The SOL9641AX/BX features a unique paste rheology, enables the paste transfer through “knotless screen” with smooth finger geometry, which can print defect-free through a less than 26 µm screen opening in high throughput mass production. Paired with our “floating Busbar paste” SOL9622B, we also see further efficiency gain through “Knotless Screen”-Dual Printing.

Products	9631C	9641AX	9641BX
Screen	Conventional	Knotless	
	360x16x32FO	290x20x25FOx14EOM	
Eff. [%]	--	+ 0.09%	+ 0.13%
Isc [mA]	--	+ 50	+ 36
Voc [mV]	--	+ 0.1	+ 0.2
FF [%]	--	- 0.1	+ 0.19
Aspect ratio	0.48	0.6	0.64

Note: EOM thickness: 12-16 µm

TYPICAL PROPERTIES

Wafer types:

- Monocrystalline
- Multicrystalline

Recommended finger opening:

Single Print: 28–45 µm

Dual Print: suggest to be paired with Heraeus busbar paste SOL9622B

Solid content: 91.00 ± 1.0%

Fineness of Grind (FOG):

- 4th scratch: ≤ 10 µm
- 50%: ≤ 5 µm

Viscosity:

SOL9641AX/BX:

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

RECOMMENDED PROCESSING GUIDELINES PRINTING

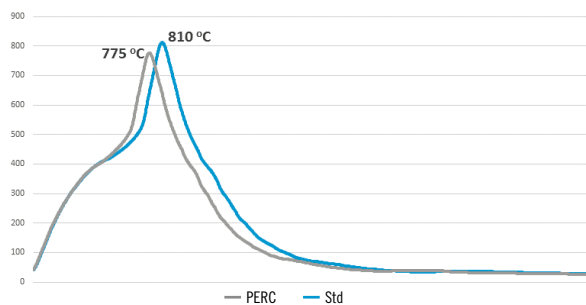
Knotless Screen Recommendation:

Vendor	Mesh	Mesh THK	Emul-sion	Finger Num.	BB Num.	Designed Opening
L	290*20	25 µm	14 µm	101	4	22–26 µm
H	325*16	25 µm	14 µm	101	4	22–26 µm
S	400*19	25 µm	14 µm	101	4	22–26 µm

In order to get the best performance, we strongly suggest to contact our technical team for their recommendation on Paste-Screen package, as well as our customization service.

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: same as SOL9641A and SOL9641B series



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

Storage:

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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