

SOL9651D Series



FRONT-SIDE PASTE

efficiency

Patent Pending



Front-side Silver Paste Designed for Diamond-Wire-Cut mc Cell

- New glass with great adhesion and reliability on DWC/Black-silicon cells
- Specially designed organic vehicle for DWC/Black-silicon texturing
- Single, double-printing and Knotless screen package available

The Heraeus SOL9651D series front-side silver paste was specially designed for the emerging Diamond-Wire-Cut (DWC) multicrystalline solar cells with specially textured surface. In addition to great cost reduction, SOL9651D can raise the conversion efficiency of DWC cells by > 0.1%.

The new glass chemistry was developed to provide excellent adhesion of SOL9651D, which allows customers to optimize their busbar design for better electrical performance and cost reduction, especially on DWC/Black-silicon texturing. This series of paste has a wide firing window which makes the paste specifically suitable for the application on PERC solar cells. It shows superior adhesion for PERC cell and is compatible for both multi and mono crystalline wafers. As testified by customers SOL9651D Series has outstanding LID (Light Induced Degradation) performance by reducing the negative impact of irradiation on the charge carrier lifetime. Specifically designed SOL9651D double-printing package is also available, as well as the „Knotless®“ screen paste SOL9651DX.

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

KEY BENEFITS

- Superior busbar adhesion and reliability on DWC cells with Additive/MCCE/RIE-texturing
- Ultra-fine-line compatibility for additional efficiency gain on specially textured DWC cells
- Balanced metallization contact and Voc with efficiency improvement
- Single, double printing and knotless screen packages are available

ULTRA-FINE-LINE PRINTING ON DWC CELLS

Due to the specially “polished” surface of DWC cells, the organic vehicle of SOL9651D has been fine-tuned for such textured surface, and still provide fine-line printability without defects in mass production.

There are dedicated double and dual printing packages available, to meet diverse customer demands that can maximize the efficiency/cost ratio through double-printing.

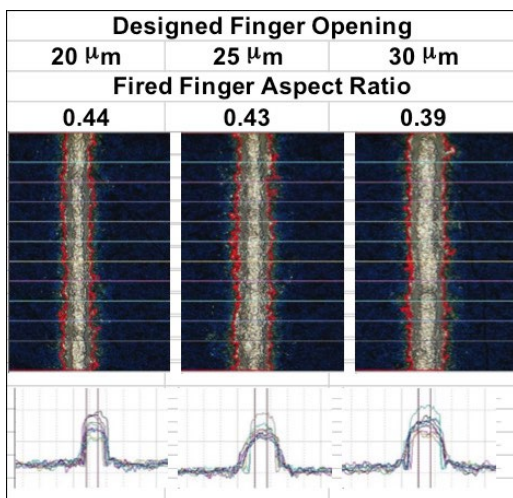


Figure 1: Fine-line printing on DWC cells

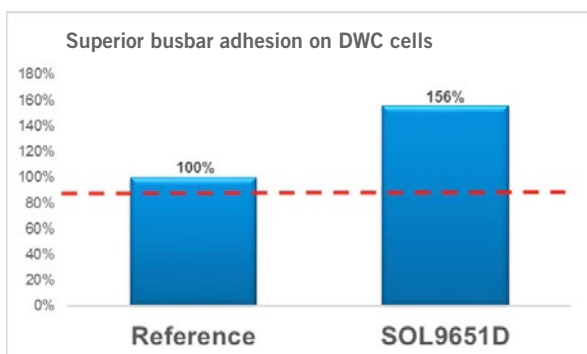
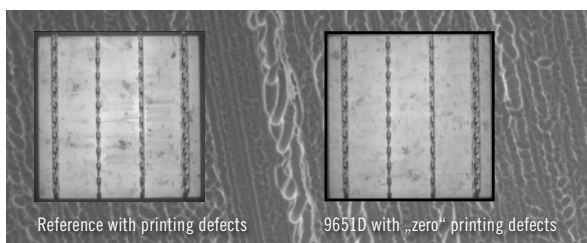


Figure 3: Customer feedbacks on adhesion

TYPICAL PROPERTIES

Wafer types:

Conventional multicrystalline and Diamond-Wire-Cut cells with Additive, MCCE and RIE texturing

Recommended finger opening:

Single Print: 28–40 μm

Double Print: to be optimized based on customer case

Solid content: 91.0 ± 0.5%

Fineness of Grind (FOG):

- 4th scratch: ≤ 10 μm
- 50%: ≤ 5 μm

Viscosity:

CPE-51 spindle (Brookfield):
40–120 kcps at 1 rpm, 25°C

RECOMMENDED PROCESSING GUIDELINES

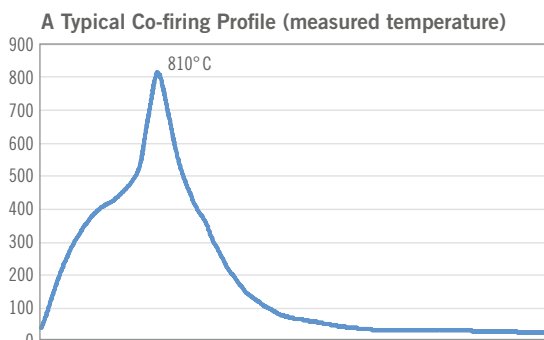
Printing: Screen parameter recommendations with stainless steel screen:

- ≥ 28–40 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 5°C–25°C. Allow paste to come to room temperature prior to opening. Spatulate well before using.

EUROPE (GERMANY)

Heraeus Deutschland GmbH & Co. KG
63450 Hanau
Phone +49 6181 35 5051
pv.hde@heraeus.com

AMERICA (USA)

Heraeus Precious Metals North America Conshohocken LLC/Heraeus Incorporated
19428 W. Conshohocken
Phone +1 610 825-6050
pv.hpmmc@heraeus.com

ASIA (TAIWAN)

Heraeus Materials Technology Taiwan Ltd.
33855 Luzhu (Taoyuan)
Phone +886 3 321 9937
pv.hmtt@heraeus.com

ASIA (KOREA)

Heraeus Korea Corporation
16506 Suwon-si (Gyeonggi-do)
Phone +82 31 270 9428
pv.hmk@heraeus.com

ASIA (CHINA)

Heraeus Materials Technology Shanghai Ltd.
201108 Shanghai
Phone + 86 21 3357 5688
pv.hmts@heraeus.com

ASIA (JAPAN)

Heraeus K. K.
112-0012 Tokyo
Phone +81 3 6902 6564
pv.hkk@heraeus.com

ASIA (SINGAPORE)

Heraeus Materials Singapore Pte. Ltd.
639335 Singapore
Phone +65 6571 7888
pv.hmsl@heraeus.com

Visit us online:
www.heraeus-photovoltaics.com
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