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.

TYPICAL PROPERTIES
Wafer types:
Conventional multicrystalline and Diamond-Wire-Cut cells with Additive, MCCE and RIE texturing

Recommended finger opening:
Single Print: 28–40μm
Double Print: to be optimized based on customer case

Solid content: 91.0 ± 0.5%

Fineness of Grind (FOG):
- 4th scratch: ≤ 10μm
- 50%: ≤ 5μm

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

RECOMMENDED PROCESSING GUIDELINES
Printing:
Screen parameter recommendations with stainless steel screen:
≥ 28–40μm opening:
calendared 360 mesh, 16μm or
calendared 430 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:

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.