



# Product Spotlight

## SOL325 Series Patent Pending

### Low Activity Ag Paste for New Passivation Layer Cell Designs

Cell efficiencies greater than 20% are becoming more common in production and Heraeus continues to support solar cell manufacturers in this effort. Heraeus introduces the SOL325 Series of silver pastes for Passivated Emitter Rear Contact cell designs and for front-side floating busbars.

The SOL325 Series are low silver tabbing pastes for c-Si wafers. During firing, SOL325 does not penetrate the cell's passivation layer. SOL325 features minimal electrical contact to the silicon, shows higher cell efficiencies, improved  $V_{oc}$ , good solderability, and excellent adhesion.

SOL325 has demonstrated efficiencies greater than 20%, with a front-side silver cost of less than \$0.01per watt. Contact your Heraeus technical service representative for more information.

### Key Benefits

- 20%+ efficiency
- Low silver content
- Excellent adhesion
- Co-fireable with back-side Al and front-side Ag pastes
- Ease of printability
- Pb and Cd free

### Typical Properties

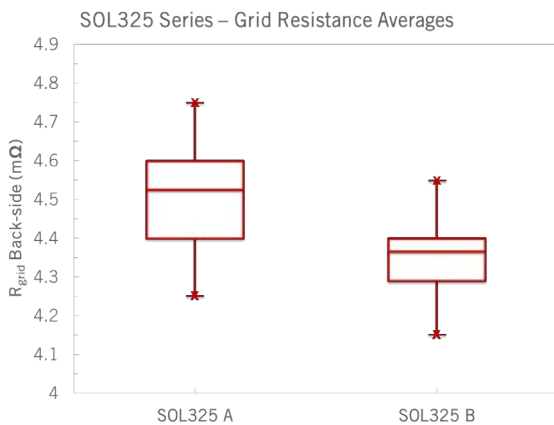
Viscosity	SOL325A	SOL325B
HBT Cone and Plate Viscometer (Brookfield)	50 – 120 kcps CPE-51 spindle, @1 RPM, 25°C	50 – 110 kcps CPE-51 spindle, @1 RPM, 25°C

Solids	SOL325A	SOL325B
Percentage	59.5 ±1.0%	67.3 ±1.5%

# Higher Performing New Passivation Layer Cell Designs with the SOL325 Series

High efficiency c-Si solar cells require longer charge carrier lifetimes, which can be achieved on passivated wafer surfaces. The recombination of charge carriers in the silicon wafer material leads to lowered open-circuit voltage and deteriorates the cell performance. Standard silver pastes affect the wafer material in close proximity to the metallization during contact formation.

Heraeus has improved the performance of our pastes for passivated wafer surfaces with the SOL325 Series. The SOL325 Series' minimal reactivity with cells reduces the recombination of charge carriers, demonstrating higher cell efficiencies, lower grid resistivity, while providing excellent adhesion (see figure 1).



**Figure 1:** Customers have experienced higher efficiency and open circuit voltages due to lower grid resistivities using the SOL325 Series and SOL9610 for PERC cell designs. In the above figure, SOL325B demonstrates lower resistivity due to higher silver content.

## Heraeus Lowers Your Cost per Watt

How can front-side silver metallization be achieved for less than \$0.01 per watt? The Institute for Solar Energy Research (ISFH) printed high efficiency solar cells (eta: 20.2%) with a silver cost less than \$0.01 per Wp for front-side metallization printing with Heraeus' SOL325A for the front-side floating busbars, in conjunction with SOL9610A for the finger lines. With an efficiency of 20.2%, you don't have to sacrifice performance for cost.

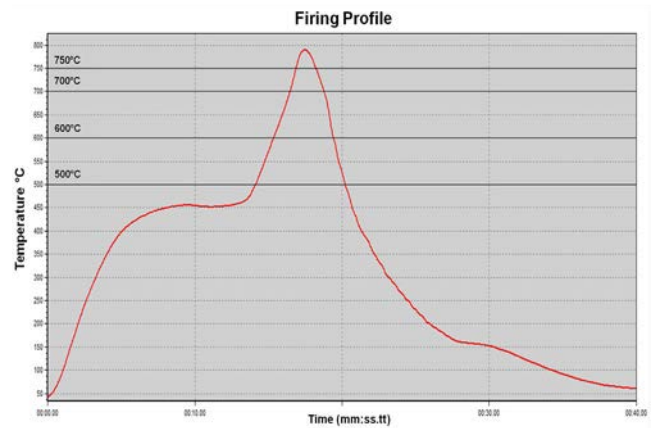
## Recommended Processing Guidelines

**Printing:** Screen Parameter Recommendations

- 230 - 280 mesh stainless steel screen
- 32 - 36 μm wire
- 5 - 15 μm emulsion

**Drying:** Typically dried in an IR belt dryer with set points of 250 – 300°C in less than 20 seconds.

**Firing:** IR furnace with actual wafer;  
Peak Temperature of approx. 740 – 800°C.



**Thinner:** RV-354

**Storage:** Store in a dry location at 5°C – 25°C.  
DO NOT REFRIGERATE.

Allow paste to come to room temperature prior to opening.  
Spatulate well before using.

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