N-type cell designs have demonstrated high efficiencies for cell manufactures and Heraeus has supported this effort for over three years with the development and mass production of our SOL9383 Series pastes. Heraeus continues to innovate through investments in R&D and has developed pastes with greater performance for n-type cells.

The Heraeus SOL9350C is our newest n-type paste for p⁺ wafer surfaces. In conjunction with our pastes for n⁺ wafer surfaces, beta test customers have demonstrated higher cell efficiencies with 20% less paste usage per cell. This translates into a significant reduction in a cell's cost per watt.
**HIGHER CELL PERFORMANCE**

Heraeus’ SOL9350 Series is our newest front-side metallization pastes for n-type cell designs with p+ wafer surfaces. The performance of this series of pastes is an improvement over our industry leading SOL9383 Series, which has been in mass production for over three years for n-type cell designs. Test results show that SOL9350 Series has significant improvement in cell efficiency and other electrical characteristics relative to SOL9383M1.

**IMPROVED PRINTABILITY**

Beyond the electrical performance, the SOL9350 Series has improved printability over the SOL9383 Series. The SOL9350 Series of pastes allow for excellent flooding and low bleed out. These features give the ability for finer line resolution with improved line uniformity and higher aspect ratio. In combination with the excellent contacting properties, overall cell performance is increased over the previous generation of paste.

**TYPICAL PROPERTIES**

**Solids:** 90.0 ± 1%

**Viscosity:**
- HBT Cone and Plate Viscometer (Brookfield):
  - 150 – 250 kcps
- CPE-51 spindle, @ 1 RPM, 25 °C
- HBT Cone and Plate Viscometer (Haake):
  - 16 – 24 Pas
- Plate/cone (Ø = 20 mm, angle = 0.5°),@ 100 s⁻¹, 25 °C

**Wafer Types:** Monocrystalline

**RECOMMENDED PROCESSING GUIDELINES**

**Printing:**

<table>
<thead>
<tr>
<th>Design Finger Line Opening</th>
<th>Screen Parameter Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 55 μm</td>
<td>290 mesh, 20 μm stainless steel wire, 12 – 16 μm EOM</td>
</tr>
<tr>
<td>≥ 50 μm</td>
<td>400 mesh, 18 μm stainless steel wire, 12 – 16 μm EOM</td>
</tr>
<tr>
<td>≥ 45 μm</td>
<td>360 mesh, 16 μm stainless steel wire, 12 – 16 μm EOM</td>
</tr>
</tbody>
</table>

**Drying:** Typically dried in an IR belt dryer with set points of 250–300 °C in less than 20 seconds or 150 °C for 10 minutes in circulated air oven.

**Firing:** IR furnace with actual wafer; peak temperature from 740–800 °C

**Finger opening:** 35–90 μm

**Storage:** DO NOT REFRIGERATE.

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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