The PCR12000 series is a lead-free resistor series that was developed for applications which require peak firing temperatures lower than traditional thick film resistors series. The PCR12000 series is formulated to fire at a 590°C peak firing temperature, which makes this series suitable for substrates such as glass for plasma display panels (PDP). The PCR12000 Series is also compatible with the Heraeus Celcion material set.

Typical Properties

<table>
<thead>
<tr>
<th>PCR12000 Series</th>
<th>PCR12045</th>
<th>PCR12019</th>
<th>PCR12020</th>
<th>PCR12035</th>
<th>PCR12038</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistance (Ω/□)</td>
<td>2 ± 10 %</td>
<td>10 ± 10 %</td>
<td>20 ± 10 %</td>
<td>40 ± 10 %</td>
<td>100 ± 10 %</td>
</tr>
<tr>
<td>Terminated: 3571 pre-fired at 620 °C.</td>
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</tr>
<tr>
<td>Resistor geometry 1 x 1 mm printed with 280 mesh screen.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>TCR (ppm°C)</td>
<td>300 ± 300</td>
<td>300 ± 300</td>
<td>300 ± 300</td>
<td>300 ± 300</td>
<td>300 ± 300</td>
</tr>
<tr>
<td>Cold TCR: -55°C to +25 °C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hot TCR: +25 °C to +125 °C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESD (1 %)</td>
<td>&lt; 0.50</td>
<td>&lt; 0.50</td>
<td>&lt; 0.50</td>
<td>&lt; 0.50</td>
<td>&lt; 0.50</td>
</tr>
<tr>
<td>1 mm x 1 mm resistor % resistance change after 2 x 2000 volt pulses</td>
<td></td>
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</tr>
</tbody>
</table>

Viscosity

PCR12035 and PCR12038

150 – 200 Kcps, Brookfield HBT,
SC4 – 14 spindle and 6R utility cup at 10 rpm at 25 °C

PCR12045, PCR12019 and PCR12020

180 – 220 Kcps, Brookfield HBT,
SC4 – 14 spindle and 6R utility cup at 10 rpm at 25 °C
Recommended Processing Guidelines

Printing Conditions
165 – 325 mesh, 1.1 mil wire and 0.5 mil emulsion screen
Allow prints to level for 5 – 10 minutes at room temperature

Print Speed
Up to 10 in/sec (25 cm/sec)

Drying Conditions
Dry at 150 °C for 8 – 10 minutes

Firing Conditions
Firing range between 550 – 650 °C
Recommended 590 °C peak temperature with a 10 minutes dwell time
Total cycle time of 30 minutes

Thinner
RV-372 (Terpineol)

Thickness Information (µm)

<table>
<thead>
<tr>
<th></th>
<th>PCR12045</th>
<th>PCR12019</th>
<th>PCR12020</th>
<th>PCR12035</th>
<th>PCR12038</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fired</td>
<td>14 – 18</td>
<td>14 – 18</td>
<td>14 – 18</td>
<td>14 – 18</td>
<td>14 – 18</td>
</tr>
</tbody>
</table>

Warranty
Material guaranteed to meet specifications for 6 months from date of shipment.

Storage
Store in a dry location at 5 – 25 °C.

DO NOT REFRIGERATE.

Allow paste to come to room temperature prior to opening.
Spatulate well before using, as settling may occur during storage.

Legend:
1) REACH compliant according to the latest ** Annex XIV to Regulation (EC) of the European Parliament and of the council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (“REACH”) by European Chemicals Agency and its subsequent amendments; the material does not contain any substance listed in Annex XIV.

2) RoHS compliant according to the latest ** Directives (European Union) of Restriction of Hazardous Substances (“RoHS”) and its subsequent amendments (including the exceptions related to Pb).

* See the data sheet issue date (DD/MM/YY) as reference of validity of latest edition which is available on request.