Product Description
DuPont CB100 conductive via plug is used to provide high conductivity, plateable vias for plastic ball grid array (PBGA), buildup substrates, and standard Printed Wired Board. It provides a simple, low cost method to create planar, thermal, and buried vias with minimum capital investment.

Product Benefits
- High thermal conductivity allows use of drilled, filled vias as heat sinks, improving thermal management
- High electrical conductivity of filled, buried vias allows reduced layer count and processing steps
- No shrinkage, one part silver epoxy system provides reliability, planarization, and ease of use
- Strong adhesion to copper and most laminate materials provides increased reliability
- Solderability after plating provides increased use of board real estate by allowing via in pad technology
- Simple application using stencil printing techniques reduces processing steps with minimal capital investment
- Aspect Ratio (via depth/diameter) Up to 6:1 with vacuum assist

Processing
- Screen/Stencil Printing Equipment
  Semi-automatic or manual with vacuum assist
- Substrates
  Epoxy glass, BT resin
- Ink Residence Time on Screen/Stencil
  >1hr
- Stencil Types
  3 -4mil stainless steel stencil recommended

Composition Properties

<table>
<thead>
<tr>
<th>Test</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viscosity (Pa.S)</td>
<td>115 - 145</td>
</tr>
<tr>
<td>[HAT UC&amp;SP, 10 rpm, 25°C]</td>
<td></td>
</tr>
<tr>
<td>Specific Gravity (g/cc)</td>
<td>≈ 5.5</td>
</tr>
<tr>
<td>Thinner</td>
<td>DuPont 5928</td>
</tr>
</tbody>
</table>

Table 1 shows anticipated typical physical properties for DuPont CB100 based on specific controlled experiments in our labs and are not intended to represent the product specifications, details of which are available upon request.

- Typical Cure Conditions
  Drying Step: 110 - 115°C for 30 minutes (Do not exceed 120°C). Curing Step: 160°C for 60 minutes (See Dry & Cure Cycle Guidelines for additional recommendations).
- Clean-up Solvents
  Axarel®, Isopropanol
- Processing Conditions
  Refer to process guidelines and/or trouble shooting guidelines. Available upon request.
Process Recommendations

Copper Clad Substrate
Drill Through Holes
Metallize
Via Plug
Dry Via Plug
Cure
Scrub
Print & Etch Process
Flash Electroplate
Print & Etch Process

Dry & Cure Cycle Guidelines
(Based on Panel Thickness)

Since other variables can effect the Dry and Cure Rate, such as board density, via diameter, oven air flow and oven load, this is meant to be a starting point to help ensure fully dried and cured plugged vias.

<table>
<thead>
<tr>
<th>Panel Thickness</th>
<th>Dry Schedule</th>
<th>Cure Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;.030</td>
<td>110°C/60 min</td>
<td>160°C/60 min</td>
</tr>
<tr>
<td>.030 - .062</td>
<td>110°C/90 min</td>
<td>160°C/90 min</td>
</tr>
<tr>
<td>.063 - .120</td>
<td>110°C/2 hrs</td>
<td>160°C/2 hrs</td>
</tr>
<tr>
<td>.121 - .175</td>
<td>110°C/3 hrs</td>
<td>160°C/3 hrs</td>
</tr>
<tr>
<td>&gt;.175</td>
<td>110°C/4 hrs</td>
<td>160°C/4 hrs</td>
</tr>
</tbody>
</table>

* Drying Step: Do not exceed 120°C

Scan CB100 Pellet
CTE, 25-115 C = 27.0 ppm/deg C
CTE, 115-200 C = 47.2 ppm/deg C

1) Heat from 25.0° C to 210.0° C at 10.0° C/min
### Table 1
**Typical Physical Properties**

<table>
<thead>
<tr>
<th>Test</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheet Resistivity (mΩ/sq) (@ 25µ thickness)</td>
<td></td>
</tr>
<tr>
<td><strong>Plated</strong></td>
<td>3 - 5</td>
</tr>
<tr>
<td><strong>Unplated</strong></td>
<td>50 - 100</td>
</tr>
<tr>
<td>Volume Resistivity (Ω/centimeter)</td>
<td>0.00016</td>
</tr>
<tr>
<td>Abrasion Resistance (H) (Pencil Hardness) [IPC-TF 870 2.4.27.2]</td>
<td>&gt; 5</td>
</tr>
<tr>
<td>TG (°C) (Glass Transition)</td>
<td>115</td>
</tr>
<tr>
<td>TCE (ppm) <em>see attached TMA</em></td>
<td>35</td>
</tr>
</tbody>
</table>

### Table 2
**Environmental Properties**

<table>
<thead>
<tr>
<th>Test</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Schock (°C) (30 minutes, Dwell) [5 cycles]</td>
<td>-40 to +85</td>
</tr>
<tr>
<td>Dry Heat (°C) [500 hours]</td>
<td>85</td>
</tr>
<tr>
<td>Humidity (°C) At 95% RH, 500 hours [Mil Std 202E, Method 102 condition A]</td>
<td>+40</td>
</tr>
<tr>
<td>At 85% RH, 10 Volt bias, 168 Hours</td>
<td>85</td>
</tr>
<tr>
<td>Thermal Cycle (°C) [1000 cycles] [IPC-TM-60 2.6.7.2]</td>
<td>-65 to +125</td>
</tr>
<tr>
<td>Thermal Stress (°C) [Solder Float] (Five 10 second cycles)</td>
<td>288</td>
</tr>
<tr>
<td>Electromigration (°C) 100% RH, 2atm, 168 hours, 50 volt (Pressure cooker Test)</td>
<td>121</td>
</tr>
<tr>
<td>HAST (°C) 100% RH, 2atm, 168 hours (Pressure cooker test)</td>
<td>121</td>
</tr>
</tbody>
</table>

**Plating**
Compatible with standard Electroless and Electro plating

**Solderability**
Solderable after plating only

**Maximum Processing Temperature**
> 175°C

**Via Plug Adhesion**
7 - 10 Pounds (31 - 48 Newton)


<table>
<thead>
<tr>
<th>Sample I.D.</th>
<th>%TML (Total mass loss)</th>
<th>% CVCM (Collected volatile condensable material)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB100</td>
<td>0.050</td>
<td>0.00</td>
</tr>
</tbody>
</table>

TML is well below the normal acceptance limit of 1.0%
CVCM is below the normal acceptance level of 0.10%

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Table 1 & 2 show anticipated typical physical properties for DuPont CB100 based on specific controlled experiments in our labs and are not intended to represent the product specifications, details of which are available upon request.
Storage and Shelf Life

Shelf life is three months from date of shipment, when refrigerated (0 – 4°C). Storage at (-15 to -20 °C) will further prolong shelf life. Storage at room temperature is not recommended. Gradual polymerization and associated viscosity increase, and mechanical separation can be expected over a period of a few months. When refrigerating and/or freezing conditions are used for storage, materials should be allowed to equilibrate to room temperature before opening to prevent pick up of moisture from condensation.

After the containers are opened, use and storage conditions and the possible effects of contamination make shelf life limits unpredictable.

Safety and Handling

For Safety and Handling information pertaining to this product, read the Material Safety Data Sheet (MSDS).

For more information on DuPont CB100 or other DuPont Microcircuit Materials products, please contact your local representative:

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