DuPont QM44H is a filled, crystallizable screen printed thick film dielectric composition. It is a versatile dielectric (with excellent via resolution) for use in both high reliability and low cost MCM (multi-chip module) and hybrid interconnect applications.

**Product Benefits**
- Broad conductor compatibility (gold, silver, and mixed metal)
- Thin, 2 print, hermetic dielectric film
- Highly resistant to EMF (Electro-Motive Force) blistering and shorting
- Robust electrical and mechanical properties
- Compatible cofire conductors

**Recommended Processing Procedures**

**Substrates**
Properties are based on test on 96% alumina substrates. Substrates of other compositions and from various manufacturers may result in variation in performance properties.

**Printing**
Printing should be carried out in a clean and well ventilated area. The combined fired thickness of the dielectric should be 30 ± 2µm. This can generally be obtained by printing the individual layers with a 280 mesh stainless steel screen. An emulsion thickness of .3 mils is typically recommended. Thinner emulsion will yield improved via resolution.

**Drying**
Allow prints to level for 5 - 10 minutes at room temperature. Then dry for 10 - 15 minutes at 150ºC.

**Firing**
Fire each dielectric print separately in a well ventilated moving conveyor furnace, in air. A 30-minute cycle with a peak temperature of 850ºC held for 10 minutes should be used.

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**Composition Properties**

<table>
<thead>
<tr>
<th>Test</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viscosity (Pa.S)</td>
<td>300 - 400</td>
</tr>
<tr>
<td>[Brookfield HBT, 10 rpm #14 spindle &amp; UC, 25ºC]</td>
<td></td>
</tr>
<tr>
<td>Coverage (cm²/g)</td>
<td>110 - 130</td>
</tr>
<tr>
<td>[based on a fired thickness of 14 µm]</td>
<td></td>
</tr>
<tr>
<td>Thinner</td>
<td>DuPont 8250</td>
</tr>
</tbody>
</table>

**Typical Physical Properties**

<table>
<thead>
<tr>
<th>Test</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Fired Thickness (µm)</td>
<td>30 ± 2</td>
</tr>
<tr>
<td>Via Resolution (µm)</td>
<td>≤ 250 - 300</td>
</tr>
<tr>
<td>Maximum number circuit layers</td>
<td>&lt; 8</td>
</tr>
<tr>
<td>Camber* (mil/in)</td>
<td>&lt; 2</td>
</tr>
</tbody>
</table>

**Typical Electrical Properties**

<table>
<thead>
<tr>
<th>Test</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dielectric Constant (@ 1 MHz)</td>
<td>8 - 10</td>
</tr>
<tr>
<td>Dissipation Factor (@ 1 MHz) (%)</td>
<td>&lt; 0.2</td>
</tr>
<tr>
<td>Leakage Current ** (µA.cm²)</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Insulation Resistance</td>
<td>&gt; 10 ** @ 100</td>
</tr>
<tr>
<td>Breakdown Voltage (V/30µm)</td>
<td>&gt; 1000</td>
</tr>
<tr>
<td>EMF Blister Resistance ***</td>
<td>&gt; 30 firing</td>
</tr>
</tbody>
</table>

*measured deflection of 5’ x 1’ substrate with 5 circuit layer, single sided  ** Standard measurements made after 5 min. @ 10VDC  *** Maximum no. of firing performed without blisters observed with Substrate/Au/Diel/Diel/Ag configuration

This table shows anticipated typical physical properties for DuPont QM44H based on specific controlled experiments in our labs and are not intended to represent the product specifications, details of which are available upon request.
Other Systems Components

<table>
<thead>
<tr>
<th></th>
<th>Silver System</th>
<th>Mixed Metal System</th>
<th>Gold System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Conductor</td>
<td>QM22 (3:1, Cofired) 7484 (3:1, Al W/B) 6277 (6:1)</td>
<td>5771</td>
<td>5771</td>
</tr>
<tr>
<td>Inner Conductor</td>
<td>QM17 (Pt/Ag) QM14 (Ag)</td>
<td>QM17 QM14</td>
<td>5771</td>
</tr>
<tr>
<td>Via Fill</td>
<td>QM34</td>
<td>QM34 (Inner) QM35 (Top)</td>
<td>5747</td>
</tr>
<tr>
<td>Resistor Series</td>
<td>S1X0</td>
<td>S1X0 S1X0</td>
<td>S1X0</td>
</tr>
</tbody>
</table>

Storage and Shelf Life
Containers should be stored, tightly sealed, in a clean, stable environment at room temperature (<25°C). Shelf life of material in unopened containers is six months from date of shipment. Some settling of solids may occur and compositions should be thoroughly mixed prior to use.

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

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