Product Description
DuPont QR150 is a very high density gold conductor composition developed for fine feature screen printing and ultra fine line etching. For applications requiring high frequency or very fine conductor features, DuPont QR150 offers thin film performance at much lower cost.

Product Benefits
- Extremely high conductivity
- Very dense fired film
- Fine line printing capability
- Excellent edge acuity when etched
- Phthalate free*

*Phthalate ‘free’ as used herein means that phthalate is not an intentional ingredient in and is not intentionally added to the referenced product. Trace amounts however may be present.

Processing Substrates
DuPont QR150 has been successfully used on a variety of substrates including 96%, 99%, 99.6% polished alumina and thick film dielectrics including DuPont QM44. The properties described in this data sheet are based on test using 96% alumina substrates. Substrates of other compositions and from various manufacturers may result in variations in performance properties.

Printing
A 400-mesh stainless steel screen. Printing speeds up to 15 cm/s (6 in/s) can be used.

Drying
Allow wet prints to level for 10-15 minutes at room temperature. Dry 15 minutes at 150°C.

Typical Physical Properties

<table>
<thead>
<tr>
<th>Test</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Resolution</td>
<td>75/75</td>
</tr>
<tr>
<td>Screen Print (µm lines/spaces)</td>
<td></td>
</tr>
<tr>
<td>Etched (µm lines/spaces)</td>
<td></td>
</tr>
<tr>
<td>Gold Wire Bonding¹ (g)</td>
<td>&gt; 7</td>
</tr>
<tr>
<td>Fired Thickness (µm)</td>
<td>5</td>
</tr>
<tr>
<td>Resistivity (mΩ/sq)</td>
<td>&lt; 5 @10µm fired</td>
</tr>
</tbody>
</table>

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, UC&amp;SP, 25°C)</td>
<td></td>
</tr>
<tr>
<td>Coverage² (cm²/g)</td>
<td>70 - 90</td>
</tr>
<tr>
<td>Thinner</td>
<td>DuPont 9450</td>
</tr>
</tbody>
</table>

¹ with 1 mil wire on 96% alumina and 99.6% alumina polished
² based on fired thickness 3.5-5 µm

*This table shows anticipated typical physical properties for DuPont QR150 based on specific controlled experiments in our labs and are not intended to represent the product specifications, details of which are available upon request.

Firing
Dried DuPont QR150 should be fired in a belt furnace. Use a 30 minute cycle with 850°C peak for 10 minutes.

Etching
DuPont QR150 may be etched in typical thin film process. DuPont QR150 may also be etched to achieve 3.5 - 5 µm fired thickness with 2 prints, 15 - 20% by weight of DuPont 9450 is required.
**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).

---

For more information on DuPont QR150 or other DuPont Microcircuit Materials products, please contact your local representative:

**Americas**
DuPont Microcircuit Materials
14 T.W. Alexander Drive
Research Triangle Park, NC 27709
Tel.: 800-284-3382

**Europe**
DuPont (U.K.) Limited
Coldharbour Lane
Bristol BS16 1QD
U.K.
Tel.: 44-117-931-3191

**Asia**
DuPont Kabushiki Kaisha
Sanno Park Tower, 11-1
Nagata-cho 2-chome
Chiyoda-ku, Tokyo 100-611
Japan
Tel.: 81-3-5521-8650

DuPont Taiwan Ltd
45, Haing-Pont Road,
Taoyuan, Taiwan 330
Tel.: 886-3-377-3616

DuPont China Holding Co. Ltd
Bldg 11, 399 Keyuan Rd., Zhangji Hi-Tech Park,
Pudong New District, Shanghai 201203, China
Tel.: 86-21-6386-6366 ext.2202

DuPont Korea Inc.
3~5th Floor, Asia tower #726,
Yeoksam-dong, Gangnam-gu
Seoul 135-719, Korea
Tel.: 82-10-6385-5399

DuPont India Private Limited
7th Floor, Tower C, DLF Cyber Greens,
Sector-25A, DLF City, Phase-III,
Gurgaon 122 002 Haryana, India
Tel.: 91-124-4091818

Du Pont Company (Singapore) Pte Ltd
1 HarbourFront Place, #11-01
HarbourFront Tower One,
Singapore 098633
Tel.: 65-6586-3022

http://mcm.dupont.com

---

Copyright © 2009 DuPont. All rights reserved. The DuPont Oval, DuPont™, The miracles of science™, Green Tape™ and all products or words denoted with ® or ™ are registered trademarks or trademarks of E.I. du Pont de Nemours and Company or its affiliates (“DuPont”).

NO PART OF THIS MATERIAL MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONIC, MECHANICAL, PHOTOCOPYING, RECORDING OR OTHERWISE WITHOUT THE PRIOR WRITTEN PERMISSION OF DUPONT.

Caution: Do not use in medical applications involving implantation in the human body or contact with internal body fluids or tissue unless the product is provided by DuPont under a formal written contract consistent with the DuPont Policy Regarding Medical Applications of DuPont Materials H-50103-2 (“Medical Applications Policy”) and which expressly acknowledges the contemplated use. For additional information, please request a copy of DuPont Medical Caution Statement H-50102-2 and the DuPont Medical Applications Policy.

The information provided herein is offered for the product user’s consideration and examination. While the information is based on data believed to be reliable, DuPont makes no warranties, expressed or implied as to the data’s accuracy or reliability and assumes no liability arising out of its use. The data shown are the result of DuPont laboratory experiments and are intended to illustrate potential product performance within a given experimental design under specific, controlled laboratory conditions. While the data provided herein falls within anticipated normal range of product properties based on such experiments, it should not be used to establish specification limits or used alone as the basis of design. It is the product user’s responsibility to satisfy itself that the product is suitable for the user’s intended use. Because DuPont neither controls nor can anticipate the many different end-uses and end-use and processing conditions under which this information and/or the product described herein may be used, DuPont does not guarantee the usefulness of the information or the suitability of its products in any given application. Users should conduct their own tests to determine the appropriateness of the products for their particular purpose.

The product user must decide what measures are necessary to safely use the product, either alone or in combination with other products, also taking into consideration the conditions of its facilities, processes, operations, and its environmental, health and safety compliance obligations under any applicable laws.

This information may be subject to revision as new knowledge and experience become available. This publication is not to be taken as a license to operate under, or recommendation to infringe any patent.

---

Copyright © 2009 DuPont. All rights reserved. The DuPont Oval, DuPont™, The miracles of science™, Green Tape™ and all products or words denoted with ® or ™ are registered trademarks or trademarks of E.I. du Pont de Nemours and Company or its affiliates (“DuPont”).

NO PART OF THIS MATERIAL MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONIC, MECHANICAL, PHOTOCOPYING, RECORDING OR OTHERWISE WITHOUT THE PRIOR WRITTEN PERMISSION OF DUPONT.

Caution: Do not use in medical applications involving implantation in the human body or contact with internal body fluids or tissue unless the product is provided by DuPont under a formal written contract consistent with the DuPont Policy Regarding Medical Applications of DuPont Materials H-50103-2 (“Medical Applications Policy”) and which expressly acknowledges the contemplated use. For additional information, please request a copy of DuPont Medical Caution Statement H-50102-2 and the DuPont Medical Applications Policy.

The information provided herein is offered for the product user’s consideration and examination. While the information is based on data believed to be reliable, DuPont makes no warranties, expressed or implied as to the data’s accuracy or reliability and assumes no liability arising out of its use. The data shown are the result of DuPont laboratory experiments and are intended to illustrate potential product performance within a given experimental design under specific, controlled laboratory conditions. While the data provided herein falls within anticipated normal range of product properties based on such experiments, it should not be used to establish specification limits or used alone as the basis of design. It is the product user’s responsibility to satisfy itself that the product is suitable for the user’s intended use. Because DuPont neither controls nor can anticipate the many different end-uses and end-use and processing conditions under which this information and/or the product described herein may be used, DuPont does not guarantee the usefulness of the information or the suitability of its products in any given application. Users should conduct their own tests to determine the appropriateness of the products for their particular purpose.

The product user must decide what measures are necessary to safely use the product, either alone or in combination with other products, also taking into consideration the conditions of its facilities, processes, operations, and its environmental, health and safety compliance obligations under any applicable laws.

This information may be subject to revision as new knowledge and experience become available. This publication is not to be taken as a license to operate under, or recommendation to infringe any patent.