

# DuPont 6160

## SILVER COMPOSITION

### Technical Data Sheet

#### Product Description

DuPont 6160 is a solderable conductor composition for high volume hybrid microcircuits and resistor networks. DuPont 6160 has been developed as a low cost alternative to palladium silver and platinum silver conductors. DuPont 6160 is a mixed bonded silver conductor with performance equal or superior to that of many platinum silver composition.

#### Product Benefits

- Very low resistivity of <2 mΩ/sq
- Good solder leach resistance in 62Sn/36Pb/2Ag solder
- SPRINT® vehicle, permitting long production runs with squeegee speeds up to 30 cm/sec

#### Processing

##### Printing

Print with 200-325 mesh stainless steel screen. DuPont 6160 may be printed at squeegee speeds of 5-30 cm/s (2-12.5 in/s) and at a rate of one substrate per second. At high printing speeds optimum results are obtained with a sharp squeegee, a 30° or 45° angle of attack, a force of 10-20 N (2-4.5 lbs of squeegee pressure).

##### Drying

Allow prints to level 5-10 minutes at room temperature. Then dry 10-15 minutes at 150°C.

##### Firing

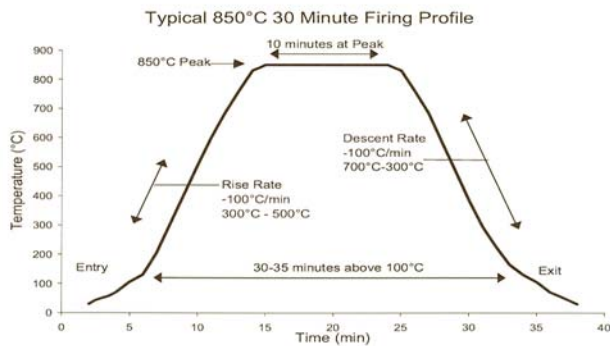
Fire with a 30-60 minute cycle to a peak temperature of 850°C for 5-10 minutes.

#### Typical Physical Properties

Test	Properties
Line Resolution (μm)	150 - 200 (6-8 mil)
Fired Thickness (μm)	16 - 20 (0.6 - 0.7 mil)
Resistivity (mΩ/sq)	< 2
Soldering	Excellent
Initial Acceptance <sup>2</sup> 62Sn/36Pb/2Ag	
Resistance to Leaching <sup>3</sup> 62Sn/36Pb/2Ag	3 cycles
Adhesion on 96% Alumina Initial (N)	≥ 22
Aged (150°C, 500 hrs) (N)	> 20
Bondability Gold Wire <sup>4</sup>	Reliable thermosonic gold wire bonds Initial and aged (1000 hr., 150°C) pull strengths of 9 grams. No bond lifts were observed.
Aluminum Wire	Not recommended
Composition Properties	
Viscosity (Pa.s) (Brookfield RVT, UC&SP and #14 spindle, 10 rpm, 25°C)	85-115
Coverage <sup>1</sup> , (cm <sup>2</sup> /g/mil)	50-60 (7.9-9.5 in <sup>2</sup> /g)
Thinner	DuPont 4553
<sup>1</sup> Based on 200-mesh stainless steel screen with 40μm wire diameter and 17.5 μm emulsion thickness <sup>2</sup> Excellent characterized as complete wetting with smooth solder film after 5-second dip at 220°C using mildly-activated flux (Alpha 611). <sup>3</sup> Cycle consists of dip in mildly-activated flux (Alpha 611), 10-second dip in solder at 220°C and washing off flux residue. <sup>4</sup> 25 μm (1 mil) gold wire thermosonic bonded.	

This table shows anticipated typical physical properties for DuPont 6160 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 30 minutes fire profile



## 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).

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.



The miracles of science™

For more information on DuPont 6160 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

Du Pont (U.K.) Limited  
Coldharbour Lane  
Bristol BS16 1QD  
U.K.  
Tel.: 44-117-931-3191

### Asia

DuPont Kabushiki Kaisha  
DuPont Electronic Center  
KSP R&D B213, 2-1, Sakado 3-chome, Takatsu-ku,  
Kawasaki-shi, Kanagawa, 213-0012, Japan  
Tel: +81-44-820-7575

DuPont Taiwan Ltd  
45, Hsing-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

E. I. 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