

DuPont 5062D and 5063D

GOLD BRAZING LOW TEMPERATURE BRAZE SYSTEM

Technical Data Sheet

Product Description

DuPont 5062D and DuPont 5063D constitute a two component all thick film paste system designed to facilitate the use of high temperature solders and low temperature braze alloys on:

- Low temperature cofire ceramic (DuPont™ Green Tape™ low temperature co-fire ceramic system).
- Alumina
- Multilayer hybrid circuits

Product Benefits

- High strength, high reliability attachment mechanism
- Hermetic packaging
- Compatibility with thick film resistors, as well as all conventional IC and lid attach processes

Processing

5062D

Printing

Print 5062D onto fired substrate using a 325-mesh, 13 µm emulsion screen

Drying

Dry in air at 150°C for 15 minutes

Firing

Fire using standard 850°C, 30 minutes profile (see figure 1). Total fired thickness should be 12-15 µm.

5063D

Printing

Print 5063D directly on top of the fired 5062D print using a 325-mesh, 13 µm emulsion screen.

Table 1
Typical Physical Properties

Test	Properties	
	5062D	5063D
Thickness (µm) Fired	12 - 15	≥ 30 (≥ 42 total)
Resistivity (mΩ/sq) [@10µm]	< 5	-
PGA Reliability ¹		
Thermal Cycle ² (N)	>65	-
Thermal Aging ³ (N)	>65	-
Seal Ring Reliability ⁴ (Atm cm ³ /s)	<10 ⁻⁸	-

¹ Average tensile pull strength of a pin a standard pin grind array (PGA) brazed to 951 Green Tape™, PGA consists of 1.8 mm diameter pad of 5062D/5063D, and a 400 µm diameter Kovar pin with a 800 µm diameter nail head.

² 200 cycles, -50°C to 150°C, rapid transfer

³ 1000 hours in air at 150°C

⁴ Helium leak test of Kovar seal ring on 951 Green Tape™ 100 Thermal cycles, -25°C to +85°C

Table 1 shows anticipated typical physical properties for DuPont 5062D & 5063D based on specific controlled experiments in our labs and are not intended to represent the product specifications, details of which are available upon request.

**Table 2
Composition Properties**

Test	Properties	
	5062D	5063D
Viscosity (Pa.S) (Brookfiel HBT, 10 rpm UC&SP#14 spindle, 25°C	260-360	225-325
Coverage ⁵ , (cm2/g)	70	90
Thinner	8672	9180
⁵ At 25 µm print thickness		

Drying

Dry in air at 150°C for 15 minutes

Repeat previous print and dry step. Ensure that 5063D completely covers the 5062D print.

Firing

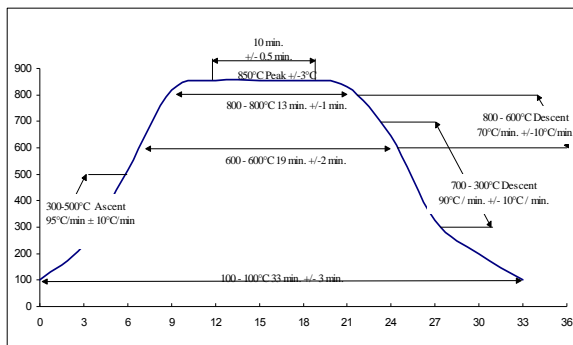
Fire using standard 850°C 30 minute profile (see figure 1). Total 5063D fired thickness should be ≥ 30 µm.

Attachment

Once the substrate has been prepared with 5062D and 5063D, pins window frames, or heat sinks may be attached with braze alloy (such as Au/In, Au/Ge, Au/Sn, etc.), performs, or pastes. Brazing is performed in a nitrogen or nitrogen/hydrogen atmosphere using fixtures which position the attachment and braze alloy directly on top of the 5062D/5063D metallization.

Figure 1

Typical 30 minute Furnace Profile



Furnace Control Points

30 MINUTE			
CONTROL POINT	NOMINAL	TOLERANCE	RANGE
100C - 100C	33 Min	+/- 3 Min	30 - 33 Min
600C - 600C	19 Min	+/- 1 Min	18 - 20 Min
800C - 800C	14 Min	+/- 1 Min	13 - 15 Min
850C DWELL (Time)	10 Min	+/- 0.5Min	9.5 - 10.5 Min
850C DWELL (Temp)	850C	+/- 3C	847C - 853C
300C - 500C ASCENT	95C/MIN	+/- 10C/Min	85C - 105C/Min
800C - 600C DESCENT	70C/Min	+/- 10C/Min	60 - 80C/Min
700C - 300C DESCENT	95C/Min	+/- 10C/Min	85C - 105C/Min
BURNOUT REMOVAL	500C*	+/- 50C	450C - 550C

*Note: Avoid removing burnout gasses above 500C on high thro-put furnaces



The miracles of science™

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 5062D & 5063D 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
Sanno Park Tower, 11-1
Nagata-cho 2-chome
Chiyoda-ku, Tokyo 100-611
Japan
Tel.: 81-3-5521-8650

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

<http://mcm.dupont.com>