DuPont Photopolymer & Electronic Materials

Ceramic Circuit Materials and Technologies

5771 Gold Conductor

Thick Film Composition Preliminary Data Sheet

All values reported here are results of experiments in our laboratories intended to illustrate product performance potential with a given experimental design. They are not intended to represent the product's specifications, details of which are available upon demand.

Product Description

5771 is a versatile screen printed, gold conductor composition used for gold interconnection and gold and aluminum wirebonding.

Key Features :

- ❑ Cadmium Free
- ❑ 25 and 50µm Au and Al wire bondable
- ❑ Excellent adhesion to a variety of surfaces
- ❑ Used as both an inner and outer conductor in multilayer designs

Design Notes

Properties are based on tests on 96% alumina substrates. Depending on the end use, 5771 may be fired at peak temperatures of 600-900°C (Hold at peak for 10 minutes)

Compatibility

Whilst DuPont has tested this composition with the recommended processing conditions, it is impossible or impractical to cover every combination of materials, customer processing conditions and circuit layouts.

It is therefore essential that customers thoroughly evaluate the material in their specific situations in order to completely satisfy themselves with the overall quality and suitability of the composition for its intended application(s).

Composition Properties

Viscosity [Pa.s] Brookfield 2 x HAT, Utility cup & spindle (SC4-14/6R), 10rpm, 25°C ± 0.2°C	**200 - 400**
Coverage[cm²/g]	**50 - 80**
Thinner	**8672**

Processing Conditions

Printing	325 stainless steel screen with a 12µm emulsion build up. Printing at speeds of up to 15 cm/sec
Drying	Allow prints to level for 10 -15 minutes at room temperature, then dry for 10-15 minutes at 150°C
Firing	850°C peak held for 10 minutes on 30 minute cycle in an air atmosphere

Typical Fired Properties[1]

Line Resolution	**≤150µm lines**	**≥150µm spaces**
Fired Thickness [µm]		**8 - 12**
Resistivity [mΩ/□@ 10µm]		**6**
Wire Bond Adhesion[2]		
Ultrsonic aluminum wire bonding 37µm wire (g)		
Initial pull strength		**22**
Aged 825 Hrs @ 150°C		**14**
Thermosonic gold wire bonding 33 µm wire(g)		
Initial pull strength		**15**

1 Typical properties are based on laboratory data using recommended processing procedures

2 All wire breaks. No bond lifts

Recommended Processing Procedure

Storage

Containers may be stored in a clean, stable environment at room temperature (< 25°C), with their

Printed in the UK

lids tightly sealed. Storage in freezers (temperature < 0°C) is NOT recommended as this could cause irreversible changes in the material.
For guidance regarding storage of material, please consult DuPont Technical Note EUT 7.2 “Shelf Life Policy”.

Shelf life
This composition has a shelf life of 6 months from date of shipment for factory-sealed (unopened) containers, stored under room-temperature conditions.

Substrates
Substrates of different compositions and from various manufacturers may result in variations in performance properties.

Thinner
This composition is optimized for screen printing, thinning is not normally required.
Use the DuPont recommended thinner for slight adjustments to viscosity or to replace evaporation losses. The use of too much thinner or the use of a non recommended thinner may affect the rheological behaviour of the material and its printing characteristics. Refer to table - “Composition Properties”

Printing
The composition should be thoroughly mixed before use. This is best achieved by slow, gently, hand stirring with a clean burr-free spatula (flexible plastic or stainless steel) for 1-2 minutes. Care must be taken to avoid air entrapment.
Printing should be performed in a clean and well ventilated area. Additional information on requirements for printing areas is contained in DuPont Technical Guide EUT 7.3 “Processing - Screen Printing Rooms”, available on request.
Note: optimum printing characteristics are generally achieved in the room temperature range of 20°C-23°C. It is therefore important that the material, in its container, is at this temperature prior to commencement of printing.
Class 10,000 printing area is recommended for building complex hybrids and multilayer circuits, otherwise severe yield losses could occur. Refer to table - “Processing Conditions”

Drying
Allow prints to level at room temperature, then dry in a well ventilated oven or conveyor dryer. Refer to table - “Processing Conditions”

Firing
Fire in a well ventilated belt, conveyor furnace, or static furnace. Air flows and extraction rates should be optimized to ensure that oxidizing conditions exist within the muffle, and that no exhaust gases enter the room.
Full information on requirements for firing is contained in DuPont Technical Guide EUT 7.4 “Process Guide - Firing”. Refer to table - “Processing Conditions”

General
Performance will depend to a large degree on care exercised in screen printing. Scrupulous care should be taken to keep the composition, printing screens and other tools free of metal contamination. Dust, lint and other particulate matter may also contribute to poor yields.

Health/Safety considerations
DuPont thick film compositions are intended for use in an industrial environment by trained personnel. All appropriate health / safety regulations regarding storage, handling and processing of such materials should be complied with. For information on health / safety regulations please refer to the specific product MSDS and to the DuPont Safety Guide EUT 7.1 “Practical Safe Handling of Thick Film Compositions”.

DuPont Photopolymer & Electronic Materials in Europe

Deutschland & Export
Du Pont de Nemours (Deutschland) GmbH
DuPont Electronic Materials
DuPont Straße 1
P.O. Box 1365
D-61343 Bad Homburg
Tel.:(+49-6172) 87-1819
Fax:(+49-6172) 87 1885

España/Portugal
Du Pont Ibérica S.A.
DuPont Electronic Materials
Avda. Diagonal 561,
08029 Barcelona
SPAIN
Tel.:(+34-3) 227 60 00
Fax:(+34-3) 227 62 14

France
Du Pont de Nemours (France) S.A.
DuPont Electronic Materials
Z.A. de Courtabœuf - Technopolis
3 Av. du Canada – B.P. 85
F-91943 Courtabœuf Cedex
Tel.:(+33-1) 69 82 54 32
Fax:(+33-1) 69 82 54 98

Italia
Du Pont de Nemours (Italiana) S.p.A.
DuPont Electronic Materials
16, Via A. Volta
I-20093 Cologno Monzese
Tel.:(+39-2) 25 30 21
Fax:(+39-2) 254 77 65

U.K./Eire/Scandinavia/ Benelux
Du Pont (U.K.) Limited
DuPont Electronic Materials
Coldharbour Lane, Frenchay
Bristol,
U.K. BS16 1QD
Tel.:(+44-117) 931 3191
Fax:(+44-117) 931 3131

All other countries
Du Pont de Nemours International S.A.
DuPont Electronic Materials
P.O. Box 50
2, Chemin du Pavillon
CH-1218 Le Grand-Saconnex
Geneva, Switzerland
Tel.:(+41-22) 717 55 07/55 25
Fax:(+41-22) 717 6280

Technical Centre / Europe
Du Pont (U.K.) Ltd.
DuPont Electronic Materials
Coldharbour Lane, Frenchay
Bristol,
U.K. BS16 1QD
Tel.:(+44-117) 931 1444
Fax:(+44-117) 931 3131

DuPont Photopolymer & Electronic Materials outside Europe

Regional offices
Japan
DuPont Kabushiki Kaisha
Arco Tower,
8-1, Simomeguro 1-chome
Meguro-ku, Tokyo 153
Japan

Tel :81-3-5434-6573
Fax :81-3-5434-6593

Singapore
Du Pont Far East Inc.
DuPont Electronic Materials
1, Maritime Square
07-01 World Trade Centre
Singapore 0409
Republic of Singapore

Tel :(+65) 272 2244
Fax :(+65) 272 7494

U.S.A.
E.I. du Pont de Nemours & Co
DuPont Electronic Materials
Electronics Technology Centre
14 T.W. Alexander Drive
Research Triangle Park
NC 27709

Tel.:(+1-800) 237 43 57
Fax:(+1-302) 992 39 15

L-11293 08/98
Printed in the UK

DuPont Photopolymer
& Electronic Materials