

5771 Gold Conductor

Thick Film Composition

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.

Product Description

5771 is a cadmium free, screen printable, composition. It is used as a gold wire bondable conductor in high density hybrids. 5771 is capable of good automatic gold wire bonding yields with 1-mil and 2-mil wire. 5771 works well over multilayer dielectrics H100, 5704, 5951, QM42 and QM44.

Processing

Substrates

Properties are based on tests using 96% alumina substrates. Substrates of other compositions and from various manufacturers may result in variations in performance properties.

Screen Printing Equipment

A 325– mesh stainless steel screen with an 12 μm (0.5 mil) emulsion thickness is recommended. Printing speeds up to 15 cm/s (6 in/s) can be achieved.

Drying

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

Firing

Dried prints should be fired in a belt furnace. Use a 60 minute cycle with a peak temperature of 850°C for 10 minutes. No significant changes in performance characteristics were seen after multiple refirings at 850°C .

Table 1
Typical Fired Properties

Line Resolution:	100/100 μm lines/spaces ¹
Fired Thickness:	6-9 μm (0.3-0.5 mil.)
Resistivity:	$\leq 7.0 \text{ m}\Omega/\text{sq}$ at 9 μm fired thickness

¹ Using special screens designed for fine line printing.

Table 2
Composition Properties

Viscosity (Pa.s) (Brookfield HBT, UC&SP SC-4-14/6r, 10 rpm, 25°C)	200-300
Coverage (cm²/g)	50-80
Thinner	8672

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.

Bonding Conditions

Hughes 2460-III Automatic Gold Wire Bonder, stage 150°C, ceramic tool, 1.0 mil Au wire, tensile strength 8g min, elongation 3 to 5%.

Hughes 2460-III Automatic Gold Wire Bonder, stage 150°C, ceramic tool, 2.0 mil Au wire, tensile strength 40-45g min, elongation 3 to 5%.

K&S Model 4123 Ultrasonic Wedge Bonder, tool #41471-2535-152, 1.0 mil Al wire (1% silicon).

Safety and Handling

This product contains organic solvent and materials. The following precautions should be exercised when handling 5771:

- Use with adequate ventilation
- Avoid prolonged contact with skin
- Avoid prolonged breathing of vapor
- If contact with skin occurs, wash affected area immediately with soap and water
- Dangerous if swallowed — DO NOT CONSUME
- Refer to MSDS for more details

Table 3 Wirebond Properties			
Automatic Thermosonic			
<i>Gold Wire Bonding</i> ²			
1.0 mil Wire Diameter	Al ₂ O ₃	5704 H100	QM42
Pull Strengths Initial	11 g	11 g	11 g
2.0 mil Wire Diameter	Al ₂ O ₃	QM42	
Pull Strengths Initial	42 g	41 g	
Aged: 170°C, 1000 hr	42 g	41 g	
Aged: 85°C/85% RH, 1000 hrs.	42 g	41 g	
Thermal Cycled (-50 to +150/0.5 hr. cycle) 1000 cycles	Al ₂ O ₃	QM42	
	42 g	41 g	
Ultrasonic Wedge Aluminum Wire Bonding			
1.0 mil Wire Bonding ³			
Pull Strengths Initial		12 g	
Aged: 315°C, 125 hr		6.7 g	
² See Bonding conditions. All wire breaks. No bonds lifts			

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Caution: Do Not use in medical applications involving permanent implantation in the human body. For other medical applications, see "DuPont Medical Caution Statement," H-50102

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