

# DuPont ALN71

## GOLD CONDUCTOR

### Technical Data Sheet

#### Product Description

DuPont ALN71 is a mixed bonded cadmium-free\* gold conductor composition for use on aluminum nitride substrates. DuPont ALN71 contains an alloying agent for aluminum wire bonding and is capable of excellent automatic wire bonding yields with both gold and aluminum wire.

\*cadmium “free” as used herein means that cadmium is not intentional ingredient in and are not intentionally added to the referenced product. Trace amounts however may be present.

#### Processing Substrates

Properties are based on test on aluminum nitride substrates. Substrates from several different vendors offered consistent results.

#### Screen Printing Equipment

A 325–mesh stainless steel screen with an 12  $\mu\text{m}$  (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

Fire in a well ventilated belt conveyor furnace, in air with a 30 or 60 minute cycle to a peak temperature of 850°C for 10 minutes.

**Table 1**  
**Typical Physical Properties**

Test	Properties
Fired Thickness ( $\mu\text{m}$ )	6 - 9
Line Resolution, ( $\mu\text{m}$ ) (line/space)	125/125
Resistivity ( $\text{m}\Omega/\text{sq}$ @ 9 $\mu\text{m}$ fired thickness)	$\leq 7.0$
Using special screens designed for fine line printing.	
<b>Table 2</b> <b>Composition Properties</b>	
Viscosity (Pa.s) [Brookfield HBT, SC-4/6r (UC&SP), 10 rpm, 25°C)	200 - 300
Coverage ( $\text{cm}^2/\text{g}$ )	50 - 80
Thinner	DuPont 8672

Table 1,2 & 3 show anticipate typical physical properties for DuPont ALN71 based on specific controlled experiments in our labs and are not intended to represent the product specifications, details of which are available upon request.

#### 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).

**Table 3**  
**Wirebond Properties**

<b>Automatic Thermosonic</b>				
<i>Gold Wire Bonding<sup>2</sup></i>				
1.0 mil Wire Diameter	AIN	5704	H100	QM42
Pull Strengths Initial	11 g	11 g	11 g	11 g
2.0 mil Wire Diameter		Al <sub>2</sub> O <sub>3</sub>		
Pull Strengths Initial		42 g		
Aged: 170°C, 1000 hr		42 g		
Aged: 85°C/85% RH, 1000 hrs.		42 g		
Thermal Cycled (-50 to +150/0.5 hr. cycle) 1000 cycles	AIN	42 g		
<i>Ultrasonic Wedge Aluminum Wire Bonding</i>				
<i>1.0 mil Wire Bonding<sup>3</sup></i>				
Pull Strengths Initial		12 g		
Aged: 315°C, 125 hr		6.7 g		

<sup>2</sup>See Bonding conditions. All wire breaks. No bonds lifts

### 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).

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