

DuPont 7484R

PALLADIUM/SILVER CONDUCTOR

Technical Data Sheet

Product Description

DuPont 7484R Palladium/silver conductor Composition is intended to be applied to ceramic substrates by screen printing and fired in a conveyor furnace in an air atmosphere to form interconnection tracks and pads for component and lead attachment, in hybrid microcircuits and networks

Product Benefits

- Fine line resolution
- Thin, dense fired films
- Fireable on 30-or 60-minutes 850°C profiles
- Excellent solderability on both Alumina and DuPont QM44 or DuPont 5704 Dielectric
- Excellent aged adhesion on Alumina and on DuPont QM44 or DuPont 5704 Dielectric
- Phthalate, Cadmium, Nickel oxide free*

*Phthalate, Cadmium, and Nickel oxide 'free' as used herein means that cadmium, phthalate and nickel oxide are not intentional ingredients in and are not intentionally added to the referenced product. Trace mounts however may be present.

Compatibility

When processed under recommended conditions, DuPont 7484R is compatible with most DuPont Resistors systems. Compatible with DuPont 5704 and DuPont QM44 Dielectrics when separately fired. DuPont 7484R is not suitable for cofiring on top of DuPont 5704 and DuPont QM44 Dielectrics.

Processing Substrates

Properties are based on test on 96% alumina substrates. Substrates of other compositions and from various manufacturers may result in variations in performance properties, as may different lots of substrates, and any subsequent processing of substrates (e.g., laser scribing/drilling) prior to printing.

Printing

Conductor compositions DuPont 7484R should be thoroughly mixed before use. This is best achieved by slow, gentle, hand stirring with a clean, burr-free spatula (flexible plastic) for 30 seconds. Care must be taken on avoid air-bubble entrapment. Printing should be carried out in a clean, well-ventilated area.

Note: Optimum printing characteristics of DuPont 7484R are generally achieved in the temperature range 20-23°C. It is therefore important that the material, in its container, is at this temperature prior to printing.

A 325-mesh stainless steel screen with a 10-12µm emulsion thickness is normally suggested. 200 mesh screens, can be used but will result in greater fired thickness. Print speeds of up to 25 cm/s may be used.

Fine Line Printing

To achieve the optimum print resolution the following printing parameters are suggested: 325-mesh stainless steel screen with a tension of 30N/cm, emulsion thickness of 12 microns, a print speed of 12.5 cm/s with a 70-80 durometer shore hardness squeegee at an angle of 45°, snap-off of 1.0 mm for a 10 x 8 inch screen.

Drying

Allow prints to level for 5-10 minutes at room temperature, in a clean. Environment, followed by drying for 10-15 minutes at 150°C in a well ventilated oven or conveyor dryer.

Firing

Fire in a well ventilated belt or conveyor furnace, in air with 30-60 minutes cycle to a peak temperature of 850°C. Care must be taken to ensure that any gases/vapors from other chemicals/materials (e.g., halogenated solvents) do not enter the furnace muffle. It is also essential that the air supply to the furnace is clean, dry and free of contamination.

**Table 1
Typical Fired Properties**

Test	Properties	
	On Alumina	On 5704
Fired Thickness line, Pads (μm)	9 - 13	-
Print Resolution (μm lines and space)	≥ 150	-
Resistivity ¹ ($\text{m}\Omega/\text{sq}$)	15 - 30	23 - 28
Solder Acceptance ^{2, 3} (%)	> 96	> 96
Solder Leach Resistance ^{3,4} (#of dips)	7 - 9	7 - 9
Adhesion ^{3, 5}		
Initial (N)	>20	>20
Aged (N)	>20	>20
250 μm Al WireBond Adhesion ⁶		
Initial (g)	> 500	> 500
Aged @150°C, 48 hrs(g)	> 500	> 500

¹ Normalized to fired thickness of 12 μm
² Percentage of defect free 2 x 2 mm pads, Alpha 611 RMA flux, 5 sec dips in 62Sn/36Pb/2Ag solder at 220°C
³ Firing 1,3 or 5 firing 30 or 60 minute profile
⁴ Number of 10 sec dips on 62Sn/36Pb/2Ag solder at 230°C, 500 μm lines
⁵ See DuPont peel adhesion test procedure
⁶ 250 μm wire bonding, Orthodyne Model 20, heavy Al Bonder, First bond setting: force 500 gms, Time setting 5 (approx. 250 ms), Power setting for first and second bonds 3.0

**Table 2
Composition Properties**

Test	Properties
Viscosity (Pa.S) [Brookfield HBT, UC&SP, 10rpm, 25°C]	150 - 230
Coverage, cm^2/g [based on fired film thickness of 11 μm]	85 - 95
Thinner	DuPont 4553

Table 1 & 2 show anticipated typical physical properties for DuPont 7484R based on specific controlled experiments in our labs and are not intended to represent the product specifications, details of which are available upon request.



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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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