

Technical Data Sheet

THICK FILM MATERIALS

Product Type: Conductors

Product Name: C7720 (LPA913-294)



Copper Conductor / DPIS*

* Development Product Information Sheet

Description

C7720 is a lead-free copper conductor system developed for applying thick layers of copper onto **96 % alumina, and lapped and pre-oxidized AlN substrates**. It is intended for use where cost sensitive applications involving high thermal and electrical properties are required. C7720 can be applied by screen or stencil printing, dried in air and fired in a Nitrogen atmosphere.

Key Benefits

- High fired film thickness
- Excellent electrical and thermal properties
- Excellent fired film density
- Aluminum thick wire bondable
- Suitable for NiAu-plating (ENIG)
- Free of lead, cadmium and nickel
- REACH⁴ and ROHS⁵ compliant

Processing

- 1) Spatulate well prior to processing.

When stored in a refrigerator: The paste should have acquired room temperature before being opened, to avoid condensation.
- 2) Pretreatment of AlN substrates

Prior printing, the pre-lapped substrate should be fired for 1.5 h in air at 1150 °C to form an oxide layer for excellent cohesion.
- 3) Print through a 80 – 160 mesh stainless steel screen
- 4) Level at room temperature for 10 – 15 minutes.
- 5) Dry at 150 °C for 10 minutes.
- 6) Fire the paste in Nitrogen with O₂ between 2 – 10 ppm at 950 °C (peak) for 10 – 12 minutes, and with a total firing cycle time of approx. 60 minutes.

Thinner

HVS 507

Typical Properties (Paste)

| | |
|----------------|--|
| Form | Pseudoplastic paste |
| Viscosity | 30 – 90 Pas (25 °C, D = 100/s) |
| Solids | 90.0 % ± 1.5 % |
| Printing Speed | Up to 6 cm/s |
| Coverage | c. 45 cm ² /g (FFT: 30 µm) (measured on alumina 96 %) |
| Shelf Life | 6 months from date of shipment with correct storage (in a dry, cool (5 – 25 °C) and dark place with container tightly shut). |

Typical Properties (Fired)¹

| | |
|---|---|
| Fired Film Thicken. (FFT) | a) 1 print ² : 40 – 60 µm b) 6 prints ³ : 220 – 300 µm |
| Resistivity | ≤ 0.8 mΩ/□ (FFT: 50 µm) |
| Solderability (Sn96/Ag3.5/Cu0.5) | Good ≥ 95 % (245 °C, 5s dip) (assessment acc. DIN 41850-2 E) |
| Aged Adhesion (Sn96/Ag3.5/Cu0.5) | ≥ 18 N (48 h, 150 °C) |
| Leach Resistance (Sn96/Ag3.5/Cu0.5) | ≥ 5 dips (245 °C, 5s each) |
| Bond Adhesion ⁶ Pull test: Shear test: | 300 µm Al wire (Al H11), initial ≥ 670 cN, 100 % wire break ≥ 1460 cN, no lift off, all bond Nuggets >> 50 % |

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Legend:

- 1) Typical properties based on laboratory test methods. For optimum results all materials should be fired in a profiled furnace supplied with dried, hydrocarbon and other contaminant free Nitrogen (PP-1).
- 2) Measured after 1 x Print-Dry-Fire with an 80 mesh stainless steel screen; thickness of screen and emulsion combined was c. 145 µm, and the resultant printed track was 500 µm wide.
- 3) Measured after 6 x Print-Dry-Fire with an 80 mesh stainless steel screen; thickness of screen and emulsion combined was c. 145 µm, and the resultant printed track was 500 µm wide.
- 4) REACH compliant according to the latest ** Annex XIV to Regulation (EC) of the European Parliament and of the council on the Registration, Evaluation, Authorisation and Restriction of Chemicals ("REACH") by European Chemicals Agency and its subsequent amendments; the material does not contain any substance listed in Annex XIV.
- 5) RoHS compliant according to the latest ** Directives (European Union) of Restriction of Hazardous Substances ("RoHS") and its subsequent amendments (including the exceptions related to Pb)
- 6) Al wire bonded in HERAEUS Labs; other values may depend on various parameters e.g. bonder, bonding speed, wire, loop lengths employed, etc.

* See the data sheet issue date (DD/MM/YY) as reference of validity of latest edition which is available on request

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