

Technical Data Sheet

THICK FILM MATERIALS

Product Type: Conductors

Product Name: C7403 / C7404A



Lead Free Thick Copper Conductor System

Description

C7403 / C7404A is a lead free, ENIG plateable, wire bondable copper conductor system developed for applying thick layers of copper. It is optimized for lapped AlN substrates as well as 96 % alumina. It is intended for use where cost sensitive applications involving high thermal and electrical properties are required. C7403 / C7404A are applied by screen printing, dried in air and fired in a nitrogen atmosphere. C7403 is applied by printing as the base layer. C7404A is printed on top of C7403 to build the thick layered film up to 300 µm.

Key Benefits

- REACH³ and ROHS⁴ compliant
- Lead, cadmium and nickel free
- Compatible with AlN and Al₂O₃
- Excellent electrical and thermal properties
- Excellent fired film density
- High fired film thickness (up to 300 µm)
- ENIG and ENEPIG plateable
- Wire bondable – thick Al wire

Typical Properties

Resistivity

< 3.0 mΩ/□ at 25 µm fired film thickness

Solderability¹

SAC 305 at 240 – 250 °C
5 sec. dip, RMA flux
> 95 %

Adhesion¹

80 x 80 mil pad
SAC 305 at 240 °C
RMA flux
Initial: ≥ 4.0 lbs (> 20 N)
Aged: ≥ 4.0 lbs (> 20 N) (48hrs at 150 °C)

Viscosity

C7403: 120 – 220 Kcps
C7404A: 150 – 250 Kcps
Brookfield HBT, SC4 – 14 at 10 rpm, 25 °C

Coverage

25 cm²/g at 50 µm fired film thickness

Solids

C7403 89.0 ± 2.0 %
C7404A 90.2 ± 2.0 %

Recommended Processing Guidelines

Processing Sequence

- 1) Print C7403 base layer, dry, fire
- 2) Overprint with subsequent layers of C7404A where increased thickness is needed, dry, fire

Drying

125 °C for 10 minutes

Firing Profile

Fire in Nitrogen with O₂ between 2 – 10 ppm
925 – 950 °C peak
Dwell time of 8 – 10 minutes

Typical Fired Thickness²

C7403 Base Layer:		
105 mesh/ 15 µm emulsion	≈	50 µm
C7404A Second Layer:		
105 mesh/ 15 µm emulsion	≈	50 µm
C7404A Third Layer:		
105 mesh/ 15 µm emulsion	≈	50 µm
Total Thickness:	≈	150 µm

* Recommend 200 mesh / 13µm emulsion for final top layer

Thinner

RV-507

Warranty

To be determined

Storage

Store in a dry location at 5 – 25 °C.

DO NOT REFRIGERATE.

Allow paste to come to room temperature prior to opening. Materials should be mixed thoroughly before using, as settling may occur during storage.

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Legend:

1) After Electroless Nickel Immersion Gold (ENIG) plating.

2) 5 layers of C7404A can be printed to achieve a fired film thickness of up to 300 µm.

3) 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.

4) 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)

* 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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