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COPPER CONDUCTOR

2312-A-3

CONDUCTOR DESIGNED FOR THICK PRINTING

ESL 2312-A-3 is a copper paste especially designed for thick printing. These thick copper conductor traces will handle higher currents than the normal thick film traces. Using an 80 mesh screen with a 115 micrometers thick emulsion, a fired film thickness of approximately 70 micrometers can be achieved with one print; two prints fired separately will yield a fired film thickness of approximately 160 micrometers. The third layer can be attained using a 165 mesh screen (30 micrometers emulsion) in order to provide a smooth surface, and will give a total thickness of approximately 175-185 micrometers. The desired fired film thickness will be determined by the screen mesh and emulsion thickness used.

This material can be fired at 900°C to 980°C in nitrogen. Optimum performance can be achieved by firing at 980°C.

PASTE DATA

RHEOLOGY:	Thixotropic, screen printable paste
VISCOSITY: (Brookfield RVT, ABZ Spindle, 10 rpm, 25.5°C±0.5°C)	225±25 Pa·s
BONDING MECHANISM:	mixed
SHELF LIFE:	6 months

PROCESSING

SCREEN MESH/EMULSION:	80 mesh / 115µm emulsion 165 mesh / 30 µm emulsion
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2312-A-3 0303-D

ESL Affiliates

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See Caution and Disclaimer on other side.

LEVELING TIME: (25°C)	5-10 minutes
DRYING TIME: (125°C)	10-15 minutes
FIRING RANGE:	900°C-980°C
OPTIMUM:	980°C
TIME AT PEAK:	10-12 minutes
ATMOSPHERE:	nitrogen
SUBSTRATE OF CALIBRATION:	96% alumina
THINNER:	ESL 401

TYPICAL PROPERTIES

Based on RTC IR firing in nitrogen, belt speed of 90 mm/minute

FIRING TEMPERATURE:	980°C
FIRED THICKNESS, ONE LAYER:	70-75 µm
FIRED THICKNESS, TWO LAYERS:	150-160 µm
FIRED THICKNESS, THREE LAYERS:	175-185 µm
RESISTIVITY: (25 µm fired thickness, achieved with 325 mesh/25 µm emulsion screen)	≤ 1.5 mΩ/sq.
SOLDERABILITY: 63 Sn/37 Pb solder, 250°C±5°C	Good
SOLDER LEACH RESISTANCE: (No. of 10 sec. dips to double resistance of 0.25 mm wide x 100 mm long conductor) 63 Sn/37 Pb solder, 250°C±5°C	≥ 4
ADHESION: (2 mm x 2 mm pads, 180 µm fired thickness, pull test)	
INITIAL:	≥ 65 N
100 HOURS AT 150°C:	≥ 70 N
ALUMINUM WIREBOND: (300 µm Al wire)	≥ 520 g

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CAUTION: Proper industrial safety precautions should be exercised in using these products. Use with adequate ventilation. Avoid prolonged contact with skin or inhalation of any vapors emitted during use or heating of these compositions. The use of safety eye goggles, gloves or hand protection creams is recommended. Wash hands or skin thoroughly with soap and water after using these products. Do not eat or smoke in areas where these materials are used. Refer to appropriate MSDS sheet.

DISCLAIMER: The product information and recommendations contained herein are based on data obtained by tests we believe to be accurate, but the accuracy and completeness thereof is not guaranteed. No warranty is expressed or implied regarding the accuracy of these data, the results obtained from the use hereof, or that any such use will not infringe any patent. Electro-Science assumes no liability for any injury, loss, or damage, direct or consequential arising out of its use by others. This information is furnished upon the condition that the person receiving it shall make their own tests to determine the suitability thereof for their particular use, before using it. User assumes all risk and liability whatsoever in connection with their intended use. Electro-Science's only obligation shall be to replace such quantity of the product proved defective.

2312-A3, Resistivity vs. Fired Thickness

