



ESL ELECTROSCIENCE

CERAMIC TAPES &
THICK-FILM MATERIALS

416 EAST CHURCH ROAD
KING OF PRUSSIA, PA 19406-2625, U.S.A

T: 610-272-8000
F: 610-272-6759

www.electroscience.com

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, 10rpm, ABZ spindle, 25.5 ± 0.5 °C)	225 ± 25 Pa.s
Bonding Mechanism:	Mixed
Shelf Life (20 - 25 °C):	6 months

PROCESSING

Screen Mesh, Emulsion:	80 S/S, 115 µm 165 S/S, 30 µm
Levelling Time (at 20 °C):	5 - 10 min
Drying Time (at 125 °C):	10 - 15 min
Firing Temperature Range:	900 - 980°C Optimum: 980 °C Time at peak: 10 - 12 min Atmosphere: Nitrogen
Substrate for Calibration:	96% alumina
Thinner:	ESL 401

ESL Europe 2591 0207-C

ESL Affiliates

ESL Europe (Agmet Ltd) • 8 Commercial Road • Reading • Berkshire • England • RG2 0QZ • Tel: +44 (0) 118 918 2400 • Fax: +44 (0) 118 986 7331 • Sales@ESLEurope.co.uk

ESL Nippon • Sukegawa Bldg. • 6th floor • 3-4 Yanagibashi 1-chome • Taito-ku • Tokyo 111, Japan • Tel: +81-3-3864-8521 • Fax: +81-3-3864-9270 • Sales@ESL-Nippon.co.jp

ESL China • Room #1707, Tower A, City Center of Shanghai • 100 Zunyi Road • Shanghai, China 200051 • Tel: +86-21-6237-0336 and 0337 • Fax: +86-21-6237-0338
ESLChina@eslshanghai.net

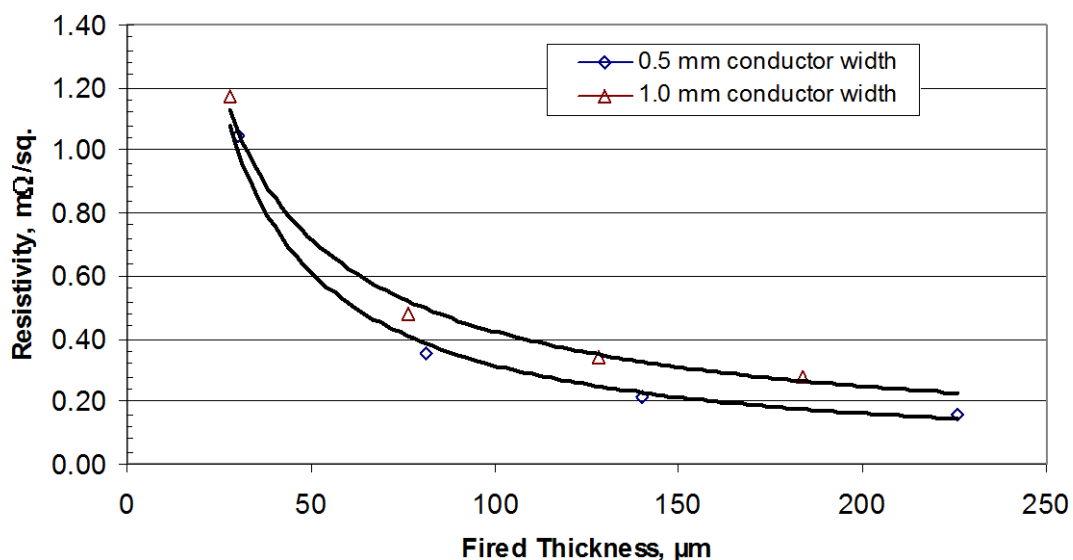
See Caution and Disclaimer on other side.

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.
Approximate Coverage:	180 cm ² / g
Solderability: (63 Sn/37 Pb solder, 250°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)	≥ 4
Adhesion: (2 mm x 2 mm pads, 180 µm fired thickness, pull test)	
	Initial: ≥ 6.6 kg
	100 Hours at 150°C: ≥ 7.1 kg
Aluminium Wire Bond: (300 µm Al wire)	≥ 520g

2312-A3, Resistivity vs. Fired Thickness



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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 vapours 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.

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