



ESL ELECTRO-SCIENCE

CERAMIC TAPES &
THICK-FILM MATERIALS

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DIELECTRIC COMPOSITION

4603
4604
4604-A

Dielectric Compositions for Aluminum, RoHS Compliant*

ESL 4603, 4604 and 4604-A dielectric pastes are designed to be used together to insulate type 3003 or 3103 aluminum. These materials should be used to provide the best voltage breakdown properties and insulation resistance. The total dielectric fired thickness must exceed 60 micrometers. Offsetting the 4604 from the 4603 on all sides is suggested. The 4604-A is a lower viscosity version of 4604.

PASTE DATA

RHEOLOGY:	Thixotropic, screen printable paste	
VISCOSITY: (Brookfield RVT, ABZ Spindle, 10 rpm, 25.5°C±0.5°C)	4603	225±50 Pa•s
	4604	120±50 Pa•s
	4604-A	80±50 Pa•s
COLOR:	4603	white/ light grey
	4604 & 4604-A	light tan
SHELF LIFE: (25°C)		6 months

PROCESSING

SCREEN MESH/EMULSION:	145-165/0-5 µm
LEVELING TIME:	5-10 minutes
DRYING AT 125°C:	10-15 minutes
FIRING TEMPERATURE:	580°C
TIME AT PEAK:	10 minutes
TOTAL CYCLE TIME:	50-60 minutes
SUBSTRATE FOR CALIBRATION:	3 mm thick, type 3003 or 3103 aluminum

4603/4604 0910-B

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See Caution and Disclaimer on other side.

THINNER:

ESL 401

COMPATIBLE MATERIALS:

ESL9912-K, 903-A, 2312-A3

TYPICAL PROPERTIES

(Two layers of 4603 separately fired and one layer of 4604 cofired at 580°C with 903-A or 9912-K conductor.)

TOTAL FIRED THICKNESS:

65-85 μm

INSULATION RESISTANCE: (at 100 VDC, 25°C)

$\geq 10^{10} \Omega$

BREAKDOWN VOLTAGE:

(at 25°C in air)

$\geq 1,500 \text{ VDC}/65 \mu\text{m}$

4603/4604 0910-B

* Complies with RoHS, ELV, WEEE and CHIP 3 EC directives

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.

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