



# Electro-Science Laboratories, Inc.

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## MULTILAYER DIELECTRIC COMPOSITION

## 4612-B

### Cadmium-Free, Lead-Free and Nickel-Free

ESL 4612-B is an alkali and lead free crystallizing dielectric material designed to match the T.C.E. of 96% alumina. It is similar to ESL 4612 but may be used where fine lines and good via retention are required.

#### PASTE DATA

<b>RHEOLOGY:</b>	Thixotropic, screen printable paste
<b>VISCOSITY:</b> (Brookfield RVT, ABZ Spindle, 10 rpm, 25.5°C±0.5°C)	400±35 Pa·s
<b>COLOR:</b>	green
<b>SHELF LIFE:</b> (25°C)	6 months

#### PROCESSING

<b>SCREEN MESH/EMULSION:</b>	200-325/38µm
<b>LEVELING TIME:</b>	5-10 minutes
<b>DRYING AT 125°C:</b>	10-15 minutes
<b>RATE OF ASCENT/DESCENT:</b>	50°C-60°C/minute
<b>FIRING TEMPERATURE RANGE:</b>	850°C-930°C
<b>CALIBRATION TEMPERATURE:</b>	850°C
<b>SUBSTRATE FOR CALIBRATION:</b>	96% alumina
<b>THINNER:</b>	

4612-B 0108-New

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See Caution and Disclaimer on other side.

## TYPICAL PROPERTIES

<b>FIRED THICKNESS:</b> (three separately fired layers on 96% alumina)	43±5 μm
<b>DIELECTRIC CONSTANT (K):</b> (1 kHz, 25°C)	7-14
<b>DISSIPATION FACTOR:</b> (1 kHz, depending on conductor at 25°C)	≤ 0.6%
<b>INSULATION RESISTANCE:</b> (at 100 VDC)	≥ 10 <sup>10</sup> Ω
<b>BREAKDOWN VOLTAGE:</b> (at 25°C in air)	≥ 900 VDC/25 μm
<b>PRINTING RESOLUTION:</b> (Minimum printable via size)	250-300 μm

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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.

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