



## ESL ELECTRO-SCIENCE

CERAMIC TAPES &  
THICK-FILM MATERIALS

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## MULTILAYER DIELECTRIC COMPOSITION

# 4913-G

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

Dielectric composition 4913-G is a cadmium-free, lead-free, and nickel-free non porous multilayer dielectric for use on alumina substrates. This dielectric may be used with selected silver or gold based conductors or combinations of these metals.

### PASTE DATA

<b>RHEOLOGY:</b>	Thixotropic, screen printable paste
<b>VISCOSITY:</b> (Brookfield RVT, 10 rpm, ABZ spindle, 25.5°C±0.5°C)	250±25 Pa·s
<b>COLOR:</b>	blue
<b>SHELF LIFE: (25°C)</b>	6 months

### PROCESSING

<b>SCREEN MESH/EMULSION:</b>	200 or 325/37 µm
<b>LEVELING TIME: (25°C)</b>	5-10 minutes
<b>DRYING AT 125°C:</b>	10-15 minutes
<b>FIRING TEMPERATURE:</b>	850°C
<b>TIME AT PEAK:</b>	10 minutes
<b>RATE OF ASCENT/DESCENT</b>	50°C-60°C/minute
<b>SUBSTRATE FOR CALIBRATION:</b>	96% alumina
<b>THINNER:</b>	ESL 401

4913-G 0507-D

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See Caution and Disclaimer on other side.

## TYPICAL PROPERTIES

### FIRED THICKNESS:

(at least 2 layers between conductors on 96% alumina)

40-55  $\mu\text{m}$

### DIELECTRIC CONSTANT (K) AT 1 MHz: (25°C)

8-11

### DISSIPATION FACTOR AT 1 MHz: (25°C)

< 0.5%

### INSULATION RESISTANCE: (at 100 VDC)

$\geq 10^{11} \Omega$

### BREAKDOWN VOLTAGE:

(at 25°C in air)

$\geq 800 \text{ V}/25 \mu\text{m}$

### LEAKAGE CURRENT:

(In 1M NaCl solution/10 VDC bias/5 minutes)

< 1  $\mu\text{A}/\text{cm}^2$

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\* 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.

**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.

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