



# Electro-Science Laboratories, Inc.

416 East Church Road • King of Prussia, PA 19406-2625, U.S.A  
610-272-8000 • Fax: 610-272-6759 • www.ElectroScience.com • Sales@ElectroScience.com

## CERMET RESISTOR SYSTEM

## 3900-J SERIES

- **Cadmium-Free Resistor Material**

The 3900-J Resistor Series are ruthenium based resistor pastes designed for use in thick film hybrid microelectronic circuits and discrete components. They combine high performance, low cost, with ease of processing.

### PASTE DATA

<b>RHEOLOGY:</b>	Thixotropic screen printable paste
<b>VISCOSITY:</b> (Brookfield RVT, ABZ spindle, 10 RPM, 25.5°C±0.5°C)	225±25 Pa-s
<b>SHELF LIFE:</b>	6 months

### PROCESSING

<b>SCREEN MESH/EMULSION:</b>	200/12.5 $\square$ m
<b>LEVELING TIME:</b> (25°C)	5-10 minutes
<b>DRYING TIME:</b> (125°C)	10-15 minutes
<b>FIRING TEMPERATURE:</b>	850°C
<b>TIME AT PEAK:</b>	10-12 minutes
<b>TOTAL CYCLE:</b>	45 minutes
<b>TERMINATIONS:</b>	9635-B
<b>THINNER:</b>	ESL 401
<b>SUBSTRATE OF CALIBRATION:</b>	96% alumina

3900-J Series 0206-Rev. A

#### ESL Affiliates

Japan: ESL-Nippon Company, Ltd. • Sukegawa Bldg. • 6<sup>th</sup> floor • 3-4 Yanagibashi 1-chome • Taito-ku • Tokyo 111, Japan • Tel: (011-81)-3-3864-8521 • Fax: (011-81)-3-3864-9270  
NipponSales@ESLNippon.com

China: Shanghai Agmet Electro-Science Laboratory Ltd. • Second Floor Bldg. 12A1 • #223 North Fe Te Road • Waigaoqiao Free Trade Zone • Shanghai, China  
Tel: (011-86)-21-5866-0497 • Fax: (011-86)-21-5866-0497 • ShanghaiSales@ShanghaiESL.com

Europe: Agmet, Ltd. • 8 Commercial Road • Reading, Berkshire, England RG2 0QZ • Tel: (011-44)-118-918-2400 • Fax: (011-44)-118-986-7331 • Sales@ESLEurope.co.uk

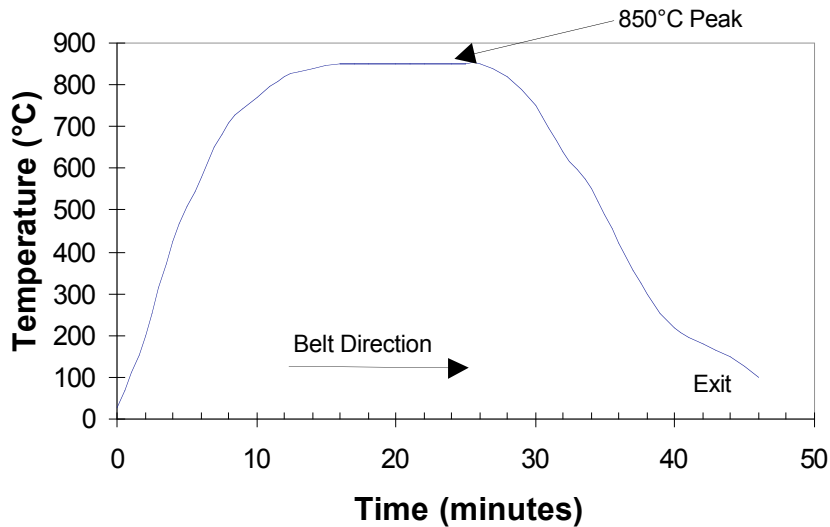
See Caution and Disclaimer on other side.

## 3900-J RESISTOR SERIES – TYPICAL PROPERTIES

PROPERTIES	3910-J	3911-J	3912-J
Viscosity (Pa·s)	225±25		
Resistivity (□/sq.)	1	10	100
Tolerance(%)	±30%	±10%	±10%
Coefficient of Variation (%)	□8	□8	□8
Dried Thickness	22.5±2.5μm		
Average TCR (ppm/°C)	0±100	0±100	0±50
CRV, % (Max)	±1.0%	±1.0%	±1.0%
Wear, % (Max)	±1.0%	±1.0%	±1.0%

- a. CRV per ESL standard test procedure TM3-18. Resistor size = 1.25mm square.  
 b. Wear per ESL standard test procedure TM3-18. Resistor size = 2mm x 20mm.

### Typical 850°C Firing Profile



3900-J Series 0206-Rev. A

**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.