



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

SEALING GLASS PASTE

4460

RoHS Compliant* • For SOFC & Other Fuel Cells

ESL 4460 is a sealing glass composition for use with YSZ ceramic and various stainless steels. It is a screen-printable or dispensable thick-film paste. ESL 4460 provides excellent breakdown voltage and is ideally printed to a thickness of 80 µm in three separately fired layers.

PASTE DATA

Rheology:	Thixotropic, screen-printable paste
Viscosity: (Brookfield RVT, 10 rpm, ABZ spindle, 25.5 ± 0.5 °C)	120 ± 20 Pa.s
Colour:	Dark blue
Shelf Life (20 - 25 °C):	6 months

PROCESSING

Screen Mesh, Emulsion:	165 S/S, 0 µm
Levelling Time (at 20°C):	5 - 10 min
Drying Time (at 125°C): (depending on substrate volume)	> 15 min
Firing Temperature Range:	850 - 930°C
	Optimum: 850°C
	Time at peak: 10 - 12 min
Rate of Ascent/Descent:	50 - 60°C / min
Thinner:	ESL 401

ESL Europe (KOP) 4460 0403-New

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 page 2.

TYPICAL PROPERTIES

Fired Thickness: 40 - 80 μm

Approximate Coverage:
(80 μm thickness) 40 cm^2 / g

Breakdown Voltage:
(measured on a 88 mm diameter 9695 print
on a 120 mm diameter area of dielectric at
25°C in air using a standard Clare Flash Tester) 1800 V AC

Insulation Resistance:
(measured on a 88 mm diameter 9695 print on a 120 mm
diameter area of dielectric using 500 VDC at 25 °C in air)
After storage at 93% \pm 2% RH, 25°C \pm 2°C for 48 hours $10^{10} \Omega$
At 300°C $10^{10} \Omega$

ESL Europe (KOP) 4460 0403-New

*None of the six substances referred to in the RoHS Directive (2002/95/EC) are used in the formulation of this product.

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.

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. ElectroScience 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 his own tests to determine the suitability thereof for his particular use, before using it. User assumes all risk and liability whatsoever in connection with his intended use. ElectroScience's only obligation shall be to replace such quantity of the product proved defective.
