



ESL ELECTROSCIENCE

CERAMIC TAPES &
THICK-FILM MATERIALS

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INSULATING COMPOSITION

4916

HOS Heaters on Steel® • COS Circuits on Steel® • TFOS Thick Film on Steel®

FOR 304 TYPE AUSTENITIC STEEL

ESL 4916 is a dielectric composition designed to insulate unoxidised 304 type austenitic steels. Three separately fired layers of 4916, having a minimum total thickness of 80 µm, provide excellent breakdown voltage between top conductive prints and the steel base. It is essential that the steel is only handled using protective gloves that all printing is carried out in clean room conditions. ESL 29XXX-A Series resistors are recommended for use as the heating elements with ESL 9695 (Pd/Ag) terminations. The heater should be protected by using an additional layer of 4916.

PASTE DATA

Rheology:	Thixotropic, screen-printable paste
Viscosity: (Brookfield RVT, 10 rpm, ABZ spindle, 25.5 ± 0.5 °C)	125 ± 25 Pa.s
Solids content:	77.0 ± 2.0 %
Colour:	Blue
Shelf Life (20 - 25 °C):	6 months

PROCESSING

Screen Mesh, Emulsion:	165 S/S, 0 µm
Drying Time (at 125°C): (dependent on substrate volume)	> 15 min
Firing Temperature Range:	850°C - 930°C in air
Optimum:	850°C
Time at peak:	10 min
Total Firing Cycle:	1 hour
Substrate for Calibration:	120 grit, unoxidised 304 stainless steel 122.5 mm diameter x 1.2 mm
Thinner:	ESL 401

ESL Europe 4916 0301-G

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See Caution and Disclaimer on other side.

TYPICAL PROPERTIES

Fired Thickness:

(of at least 3 layers between 9695 and 304 stainless steel measured using an Elcometer 345 thickness gauge) > 70 μ m

Approximate Coverage:

(80 μ m thickness) 40 cm²/g

Breakdown Voltage:

(measured on a 88 mm diameter 9695 print on a 108 mm diameter area of dielectric at 25°C in air using a standard Clare Flash Tester) 5/5 \geq 1500 V AC

Insulation Resistance:

(measured on a 88 mm diameter 9695 print on a 108 mm diameter area of dielectric using 500 V DC at 25 °C in air)

After storage at 93 \pm 2 % RH, 25 \pm 2 °C for 48 hrs.	> 10 ⁹ Ω
At 300°C	> 10 ⁹ Ω

A wide range of ESL materials are compatible with 4916 permitting the fabrication of other COS (Circuits on Steel)[®].

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*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.

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