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INSULATING COMPOSITION 4987

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

Cadmium, Lead, and Nickel-free

ESL 4987 is a dielectric composition designed to insulate unabraded, unoxidized, ferritic steels. ESL 4987 is non-porous and its TCE closely matches that of BS970/1449 Type 430-S17 or AISI Type 430 stainless steel. Three separately fired layers of 4987, having a total minimum thickness of 80 micrometers, provide excellent breakdown voltage between top conductive prints and the stainless steel base. It is essential that the stainless steel is only handled using protective gloves at all times and that all printing is carried out in clean room conditions. ESL 29XXX-C resistors are recommended for use as the heating elements with 9695 (Pd/Ag) and 9501-CH (Pt/Ag) terminations. ESL 4987 is recommended as an 850°C overglaze. These materials are also useful in other TFOS Thick Film on Steel® applications.

PASTE DATA

RHEOLOGY:	Thixotropic, screen printable paste
VISCOSITY: (Brookfield RVT, ABZ Spindle, 10 rpm, 25.5±0.5°C)	120±20 Pa·s
COLOR:	Dark blue
SHELF LIFE: (20-25°C)	6 months

PROCESSING

SCREEN MESH/EMULSION:	165/0.0 µm
LEVELING TIME:	5-10 minutes
DRYING TIME AT 125°C:(Depending upon substrate volume)	> 15 minutes

4987 0308-A

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See Caution and Disclaimer on other side.

FIRING TEMPERATURE RANGE:	850°C-930°C
Optimum:	850°C
Time at peak:	10 minutes
RATE OF ASCENT/DESCENT:	50°C-60°C/minute
SUBSTRATE FOR CALIBRATION:	Unabraded, unoxidized BS970/1449 Type 430-S17 stainless steel 122.5 mm diameter x 1.2 mm
THINNER:	ESL 401

TYPICAL PROPERTIES

(BS970/1449 Type 430-S17 stainless steel)

FIRED THICKNESS: (At least 3 layers between 9695 and stainless steel, measured using an Elcometer 345 thickness gauge)	> 80 µm
APPROXIMATE COVERAGE: (80 µm thickness)	40 cm^2/g
BREAKDOWN VOLTAGE: (Measured on an 88 mm diameter 9695 print on 108 mm diameter area of dielectric at 25°C in air, using a standard Clare Flash Tester)	>1800 VAC
INSULATION RESISTANCE: (Measured on an 88 mm diameter 9695 print on a 108 mm diameter area of dielectric using 500 VDC at 25°C in air)	> 10^9 Ω

A wide range of ESL materials are compatible with 4987 permitting the fabrication of other COS Circuits on Steel.