



ESL Electro-Science

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PARTIALLY STABILIZED ZIRCONIA TAPE

42000

Lead-Free High Temperature PSZ Tape for Use in Gas Diaphragms And Pressure Sensors

The ESL 42000 is a flexible cast film of partially stabilized zirconia (PSZ) powder dispersed in an organic matrix. This material is designed to be sintered in the temperature range of 1400°C-1500°C to yield a dense white colored ceramic. ESL 42000 tape is provided on a silicone-coated polyester film to protect the tape from mechanical damage, and aid in handling.

The high fracture strength of fired PSZ bodies allows the construction of parts having low inertial and thermal mass. Application areas include diaphragms for gas and pressure sensors. The relative flexibility of the fired ceramic suggests uses in medical pressure measurements, weighing and force gauges, automotive pressure and flow controllers.

PROCESSING: Parts are formed by blanking sheets of the tape to the required green size prior to sintering. A burnout cycle of 3°C/minute to 450°C with a 3-hour dwell removes > 95% of the organic phase. Following the burnout cycle, the recommended sintering schedule is as follows: (This schedule may be modified for larger laminated parts or custom thickness.)

SINTERING SCHEDULE:

3°C per minute to 600°C
10°C per minute to 1000°C
5°C per minute to 1450°C
30 minute dwell at 1450°C

STABILIZING AGENT: Y_2O_3

STABILIZER CONTENT: 3.0 mol %

CRYSTALLINE PHASE: (Typical) 90% Tetragonal
10% Monoclinic

FIRED SHRINKAGE:

(single layer fired at 1450°C for 30 minutes)	X, Y	22.0±1.0%
	Z	22.0±1.0%

FIRED DENSITY:
(1450°C for 30 minutes)
42000 0412 E > 98% of theoretical

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See Caution and Disclaimer on other side

FRACTURE STRENGTH: (1450°C-30 minutes, 3-point Modulus of Rupture)	≥1000 MPa
SURFACE ROUGHNESS:	0.20 μm (Ra)
TAPE THICKNESS: (Custom thicknesses available)	115±15 μm
COLOR:	paper white

42000 0412 E

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.
