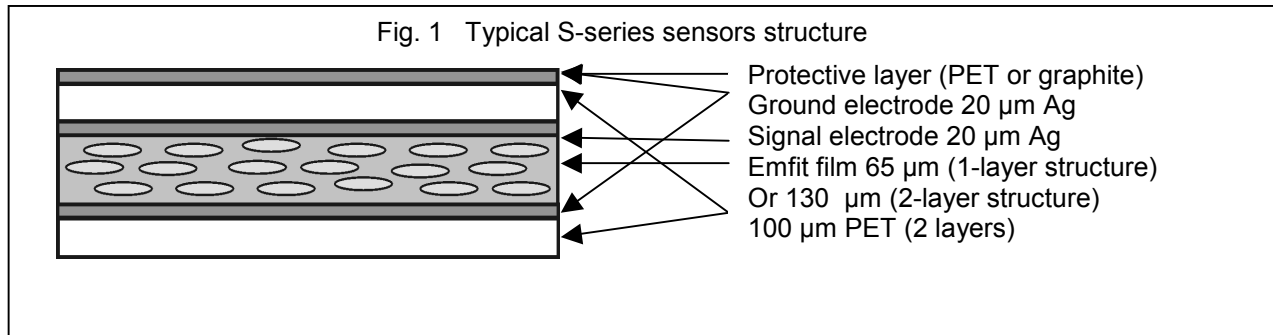


INTRODUCTION

The S-series sensor is a fully shielded, low mass, thin, small area sensor. It consists typically of a sensing element constructed of elastic electret Emfit film and 2 layers of polyester film with screen-printed silver paste electrodes (Fig. 1). Several other constructions are possible depending on application and needs. Crimped connectors are used for connecting to electrodes.

Options available are a shielded cable soldered to connectors with heat shrink tube over the joint with/without FET preamp stage integrated into the joint. A 50 microns acrylic adhesive is also optionally available on one or both sides of the element.



S-series sensors are manufactured in sheet laminating. Normally as custom made only, S-series sensors are available only in two standard sizes, 10x20 and 20x100 mm, at the moment.

USES

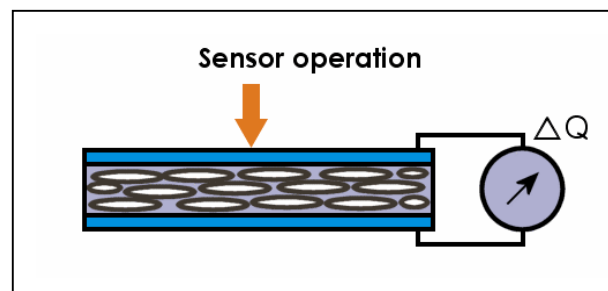
Vibration/impact sensing, accelerometers, switches, machine monitoring, acoustic emission detection, contact microphone, acoustic pickup, pyrometer...

SENSOR OPERATION

Operating in a reciprocal fashion, changes in the thickness of the Emfit sensor generate a corresponding charge and hence, voltage to appear on the electrodes. The transducer behaves like an "active" capacitor, consequently, the loading of the signal by the input impedance of the measuring device must be considered.

Due to the small area and the thinness of the films, the associated capacitance of the S-series sensors cannot normally be sufficient to give adequate low frequency response to a standard 1 M Ω load and the use of an X10 probe will extend the low frequency range by a decade. Buffering may be desirable. Again, the low mass contributed by the transducer is of major importance, as well as its non-resonate behaviour. Frequency response is inherently flat to over 20 KHz with only the R-C roll off at low frequencies distorting the profile.

Though the S-series sensor responds to thickness change rather than strain, low signal levels may be generated by low frequency flexing, so a distinction must be made between the frequency response of the film for changes in its primary parameter (i.e. thickness) and its relative behaviour compared with, say piezoelectric sensors. The sensor has a flat response over a very wide frequency range, with resonant frequency points well above 20 KHz.



OTHER SPECIFICATIONS

Property	Symbol	Value	Unit	Tolerance	Conditions
Storage temperature	Ts	from -40 to +50	°C		
Operating temperature ¹	Tr	from -20 to +50	°C		
Thickness	D	0,5	mm	±5 %	1-layer structure
Sensitivity ²	Sq	25	pC/N	±20 %	normal force
Relative permittivity	er	1,1		±10 %	@ 10 kHz
Capacitance	C	22	pF/cm ²	±5 %	@ 1–150 kHz, EQV 1
Tensile strength at break, TD		535	N	±10 %	ISO-527-1
Elongation at break, TD		20	%	±20%	
Youngs modulus, TD		0,5	Mpa	±50 %	
Operating force range	P	N/cm ²	>100		

- 1) Loss of sensitivity is < 20 % after the following temperature cycles:
 - a) 11 hours at -20 °C, 1 hour at +20 °C, 11 hours at +70 °C, 1 hour at +20 °C, 28 cycles;
 - b) 1 hour at -20 °C, 1 hour at +70 °C, 10 cycles.
- 2) Sensitivity depends on the structure and number of the Emfit layers. Max sensitivity available is up to about 400 pC/N upon special order.

ADDITIONAL INFORMATION

For additional information or assistance, please contact:

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