

INTRODUCTION

The L-series sensor is a fully shielded, low mass, thin, large surface sensor. It consists of a sensing element constructed of elastic electret Emfit film and 3 layers of polyester film with aluminium electrodes (Fig. 1, Fig. 2). Crimped connectors are used for connecting to electrodes.

Options available are a shielded cable soldered to the connectors with temperature pressed and melt protection cover over the joint (Fig 3.) with/without FET preamp stage integrated into joint. A 90 microns acrylic adhesive is also optionally available on one or both sides of the element.

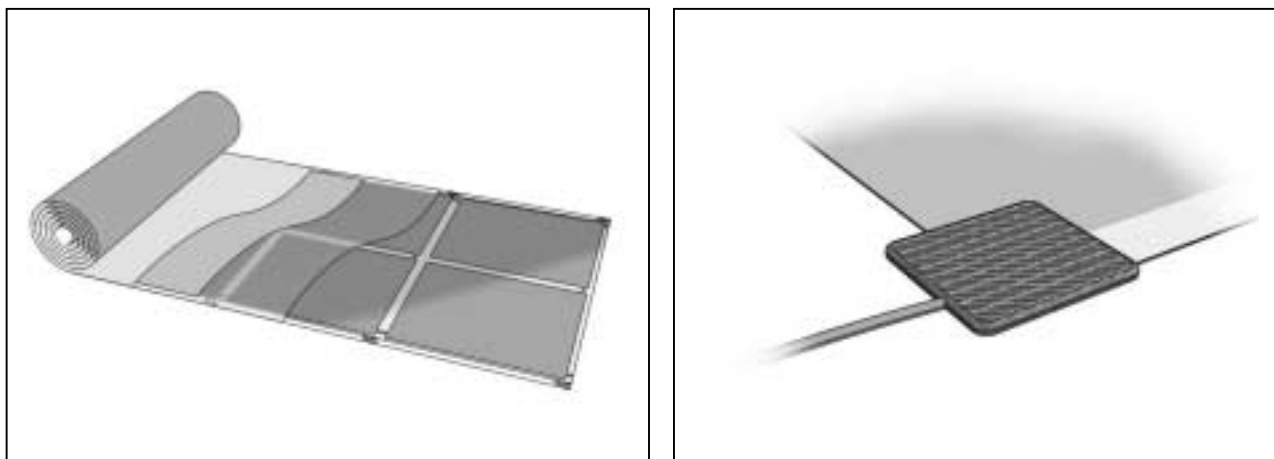
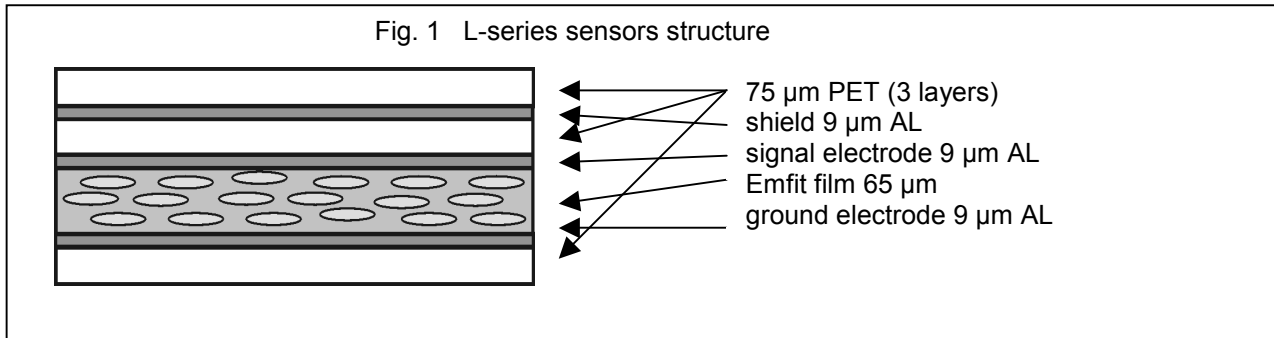


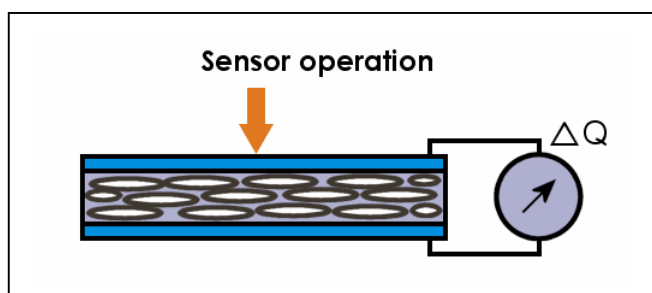
Fig. 2

USES

Safety mats, switches, security, vehicle and pedestrian counting, weigh-in-motion, apnea monitor, sleep disorder monitor, patient bed monitor, force plate, machine monitoring, acoustic emission detection, contact microphone, vibration/impact sensing, acoustic pickup, pyrometer, rain intensity, hail detection, seismic geophone, hydrophone...

SENSOR OPERATION

Operating in a reciprocal fashion, changes in thickness to Emfit sensor generate a corresponding charge and hence, voltage to appear on the electrodes. Since 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 thinness of the films, the associated capacitance can be sufficient to give adequate low frequency response into standard 1 M Ω load but the use of an X10 probe will extend the low frequency range by a decade. For extremely low force change levels, some buffering may be desirable. For the majority of analysis work, this is unnecessary and the film can feed directly to the instrument. Again, the low mass contributed by the transducer is of major importance, and 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 L-series sensor is responding 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	0,4	mm	±5 %	
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		
Standard widths ³	W	mm	290 / 580	±1 %	
Standard length ³	L	m	3	±1 %	

- 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 pre-aging and number of Emfit layers. Max sensitivity available is up to about 400 C/N on special order.
- 3) Manufactured in rolls, width 580 mm, divided into rectangular areas with size of 290 x 300 mm, which are electrically connected to each other. Can be cut both ways between each rectangular.

ADDITIONAL INFORMATION

For additional information or assistance, please contact:

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