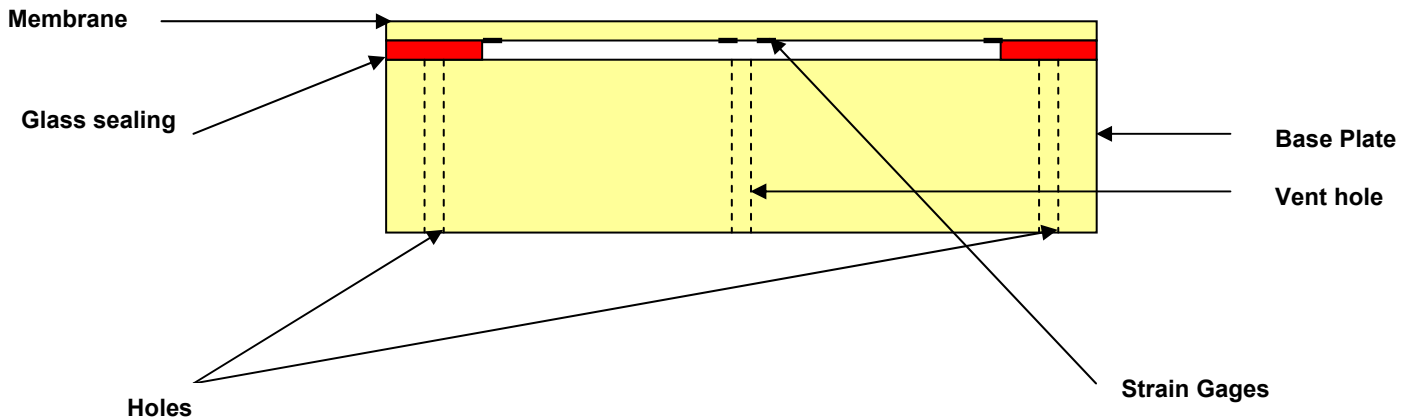


About the Thick Film Strain Gage Technology

Ceramic Pressure Sensors Manufacturing

The following schematic drawing will help understanding our technology and process:



The pressure sensor is composed of a Base Plate and a Membrane, both of them made of Al_2O_3 Alumina.

The first manufacturing step consists in making a deposition of Thick Film Conductors on the membrane, by screen printing as illustrated below:



The conductors are then placed in a climatic chamber heated at about 150° for $\frac{1}{2}$ hour in order to evaporate the solvents, and successively cured at about 850°C in a linear oven according to a specific temperature profile.

Then, the strain gages are printed on the membrane through another screen which determines their exact location and shape.

The same process applies for evaporation of the solvents and curing in another linear oven according to another specific temperature profile.

The 2 photos below illustrate the process:



Sensors loading on the rolling belt

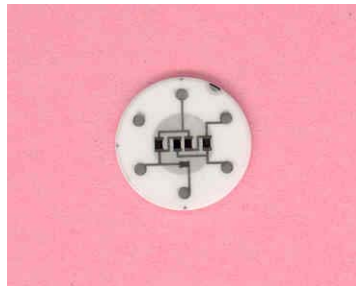


Sensors extraction after curing

After those steps, a glass deposition, again by means of screen printing is made all around the edge of the membrane, and that glass is cured according to a very specific thermal profile.

Another printing and curing allows to get a Thermistor on the membrane, which will be used later to perform the thermal compensation of the sensor.

The membrane appears then like that:



Referring to the above schematic drawing, it is time now to make the deposition of the conductors and resistors at the back of the Base Plate.

The conductors paste is sucked down by means of a vacuum pump during the printing process, so that the inner surface of the peripheral holes is coated, and will become a metallized hole after curing.

This will allow to establish the contact between the external pads appearing at the back of the base plate and the peripheral pads of the membrane, in order to get the electrical contacts out of the sensor.

A glass deposition and curing is then performed exactly as on the membrane around the edge of the base plate.

The next manufacturing step consists in putting the membrane and the base plate together (by means of an angular reference, so that the contacts are well oriented towards the pads). This "sandwich" is put back into a linear oven increasing the temperature up to the melting point of glass and then reducing the temperature slowly, down to room temperature.

In that way, the embedding of the membrane (mechanical clamping) and the sealing of the pressure capsule are obtained simultaneously.

