Ferroperm Piezoceramics

Your Partner in Smart Solutions

Frequently asked questions

Question:

What is the thermal expansion coefficient for Ferroperm PZT?

Answer:

Apart from being material-dependent, the data for this parameter are unfortunately separated into several different categories. Values for our two standard PZT materials, Pz26 and Pz27 will be given here.

For an unpoled sample it is relatively simple, since there is no anisotropy in the material yet. You should be able to use the following general values:

T interval	TEC(Pz26) (10^{-6} K^{-1})	*T* interval	TEC(Pz27) (10^{-6} K^{-1})
0 – 100° C	+1.75	0 – 150° C	+2.0
100 – 200° C	+1.0	150 – 250° C	+1.5
200 – 250° C	+0.5		

For the poled material, the situation is much more complicated.

Firstly, there is apparently a big difference between the first heating and subsequent heatings. If this is a critical point for your process, we would therefore recommend to heat-treat the material (for example 0.5 - 1h at 220°C) before assembly. If possible, this should be done in stress-free and short-circuit conditions.

Secondly, the material is now anisotropic, and you therefore have to differentiate between the 1 and 3 directions. The general values for subsequent heatings are:

- In the 3-direction:

T interval	TEC(Pz26) (10^{-6} K^{-1})	TEC(Pz27) (10^{-6} K^{-1})
0 – 50° C	+1.5	+4.0
50 – 100° C	0.0	+4.0
100 – 150° C	-1.0	+2.0
150 – 200° C	-1.5	0.0
200 – 250° C	-2.5	-2.0

- In the 1-direction:

T interval	TEC(Pz26) (10^{-6} K^{-1})	TEC(Pz27) (10^{-6} K^{-1})
0 – 100° C	+4.0	+1.5
100 – 150° C	+4.0	+2.0
150 – 200° C	+4.0	+3.0
200 – 250° C	+3.5	+4.0