



Ferroperm™ Piezoelectric ceramics

Pz31 Low acoustic impedance PZT

A new type of piezoceramic material with very low acoustic impedance

The new Ferroperm Pz31 material is developed primarily with the aim of having very low acoustic impedance and at the same time high thickness coupling coefficient and permittivity. It has furthermore no oil or polymer infiltration, and is therefore able to operate at higher temperatures than traditional lead metaniobates.

Pz31 is therefore the optimum choice for NDT applications and other applications, where the acoustic matching is critical.

Repeatable performance

The main focus through our entire production process is to provide materials and components with the highest possible reproducibility of properties and parameters and to obtain the lowest aging rates in the industry.

Our materials have a variation of $\pm 5\%$ for all parameters. This reduces the requirements for impedance matching, frequency tuning and dimensioning of the housing meaning fewer rejects and lower costs.

Customised solutions

We have more than 60 years of experience in the production of advanced piezoelectric ceramics. Our team has extensive expertise in customising designs to match the customer's needs.

Please contact us to discuss your requirements in further detail.

Key benefits

- Lowest batch to batch variation in the industry
- Stable material with consistent performance
- Customised or standard designs

Key features

- High thickness coupling coefficient
- High permittivity

Applications

- Broadband NDT transducers
- Broadband medical transducers
- Underwater transducers
- Low frequency Doppler flow-meters

Contact

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Material properties

Electrical	Symbol	Pz31
Relative dielectric permittivity (free, 1 kHz)	K_{33}^T	295
Relative dielectric permittivity (clamped)	K_{33}^S	195
Dielectric dissipation factor (1 kHz)	$\tan \delta$	4×10^3
Curie temperature	T_c	330 °C
Recommended working range	<	230 °C
Electromechanical		
Coupling factor, planar	k_p	30
Coupling factor, thickness	k_t	52.4
Piezoelectric charge coefficient	d_{33}	160 pC/N
Frequency constant, thickness	N_t	1518 Hz m
Mechanical		
Mechanical Quality Factor*	$Q_{m,t}^E$	900
Acoustic impedance	Z_a	18.9 Mrayl
Density	ρ	6.22 g/cm ³

Note: Due to continuous process improvement, specifications are subject to change without notice.

Please be aware that extreme dimensions and geometries can lead to exaggeration in tolerances in all materials.

Pz31, Pz36, Pz37, Pz39 are a new family of materials containing a porous structure. Tolerances might therefore vary more than standard, and be more dependent on size and geometry.

* $Q_{m,t}^E$ may vary with frequency