Aerospace
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Ferroperm™ Piezoelectric ceramics

Pz39 Low acoustic impedance PZT

A new type of piezoceramic material with very low acoustic impedance

The new Ferroperm Pz39 material is developed primarily with the aim of having very low acoustic impedance and at the same time high permittivity and thickness coupling coefficient. It has furthermore no oil or polymer infiltration, and is therefore able to operate at higher temperatures than traditional lead-meta niobates.

Pz39 in combination with Pz36 and Pz37 therefore offers a complete choice of materials for NDT transducers and for 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 ±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

- NDT transducers
- Medical transducers
- Underwater transducers
- Low frequency Doppler flow-meters

Contact

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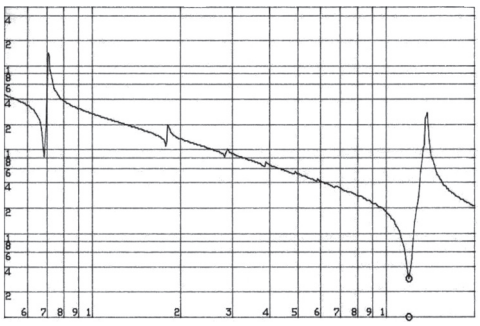
Material properties

Electrical	Symbol	Pz39
Relative dielectric permittivity at 1 kHz	K_{33}^{T}	2650
Dielectric dissipation factor at 1 kHz	tan δ	3 x 10^{-3}
Curie temperature	T_C ›	350 °C
Recommended working range		250 °C
Electromechanical		
Coupling factors	k_p	0.35
	k_t	0.52
Piezoelectric charge coefficient	d_{33}	230 pC/N
Frequency constant, thickness	N_t	1270 Hz m
Mechanical		
Mechanical Quality Factor*	$Q_{m,t}^{E}$	500
Acoustic impedance	Z_a	18 Mrayl
Density	ρ	6.6 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.
*$Q_{m,t}$ may vary with frequency



Example of the new material high anisotropy in the new material family.
Impedance plot for a circular Pz39 disc. Dimensions are OD15 mm TH 1 mm.
The frequency sweep is from 50 kHz to 2 MHz. The discs shows a planar resonance at approximately 70 kHz, with a planar coupling coefficient, kp, of only 19%. The thickness resonance at approximately 1200 kHz with a coupling factor, kt, of 53%.