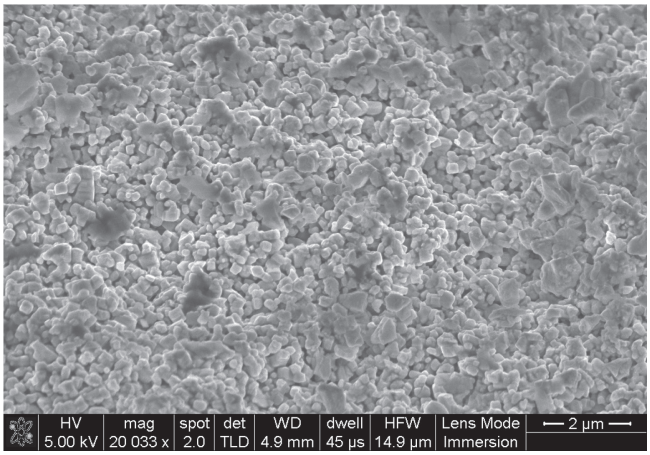
Aerospace
Defence
Energy
Industrial
Medical

Ferroperm™ Piezoelectric ceramics

InSensor® TF6100 lead-free material



SEM picture of TF6100 microstructure

Lead-free thick film

InSensor® TF6100 material is a lead-free material and is based on potassium-, sodium-, niobate (KNN). Although not all properties of KNN at present are fully matching those of PZT, KNN has a competitive advantage in medical applications where lead containing substances are banned. The material is compatible with thick film technology and the properties are almost fully conserved in the change from bulk to thick film. The change in properties is mainly attributed to increased porosity in the thick film compared to the bulk material. Although InSensor® TF6100 is not yet commercially available, it can be tested upon request.

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

- Lead-free material

Applications

- High frequency medical imaging
- Integrated miniaturised phased array ultrasound scanners
- Implants
- Intra-body diagnostics

Contact

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Material properties

Electrical	Symbol	TF6100
Relative dielectric constant at 1 kHz	K_{33}^{T}	250
Dielectric dissipation factor at 1 kHz	tan δ	‹50 x 10^{-3}
Electromechanical		
Coupling coefficients	k_p	*
	k_t	*
Piezoelectric charge coefficients (effective)	$d_{33,eff}$	80 pC/N
	d_{31}	*
Piezoelectric voltage coefficient	g_{33}	* x 10^{-3} Vm/N
	g_{31}	*
Mechanical		
Acoustic impedance	Z_a	* MRayl
Mechanical quality factor	$Q_{m,t}^{E}$	*

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.
* Under investigation