

FERROPERM

Piezoceramics A/S

NEW!

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Pz59

New High permittivity material for medical transducers

Pz59 is a newly developed material for modern 1-3 composites and array transducers. The composition is a modern relaxor type PNN-PZT.

The material has a very high permittivity, high coupling coefficients and low Q_m factor. It has a higher Curie point than modern highly expensive single crystal materials, and is therefore better suited for traditional transducer manufacturing techniques.

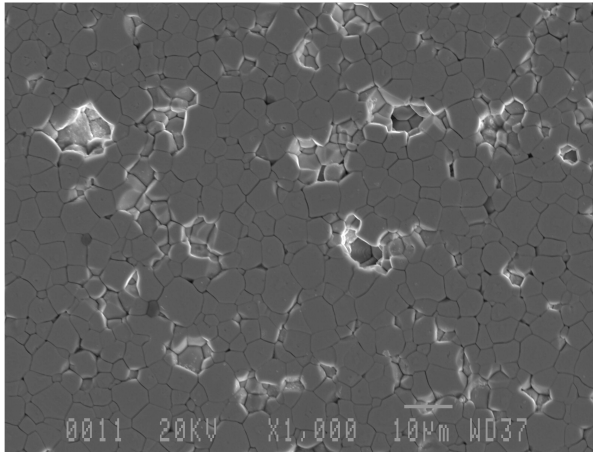
Pz59 is therefore the new ideal material for modern broadband transducer arrays and imaging systems.

Typical applications are:

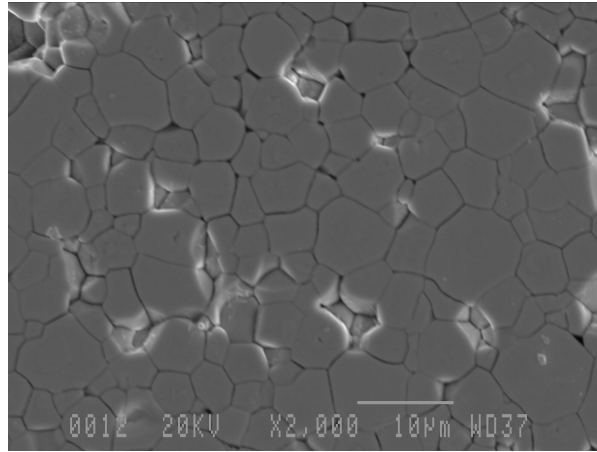
- Linear arrays for medical imaging.
- 1-3 Composites for medical imaging.
- 1-3 Composite for imaging application in sonar systems
- 1-3 Composite for imaging application in NDT systems

Main Characteristics of Ex59 (preliminary data)

	Symbol	Unit	Pz59
Electrical Properties			
Relative dielectric permittivity at 1 kHz	K_{33}^T		5100
Dielectric dissipation factor at 1 kHz	$\tan \delta$	10^{-3}	18
Curie temperature	$T_C >$	°C	150
Max. recommended working range		°C	80
Electromechanical Properties			
Coupling factors	k_p		55
	k_t		46
Piezoelectric charge coefficient	d_{33}	pC/N	645
Frequency Constant	N_t	Hz·m	2020
Mechanical Properties			
Mechanical Quality Factor	$Q_{m,t}$		40
Density	ρ	g/cm ³	7,9

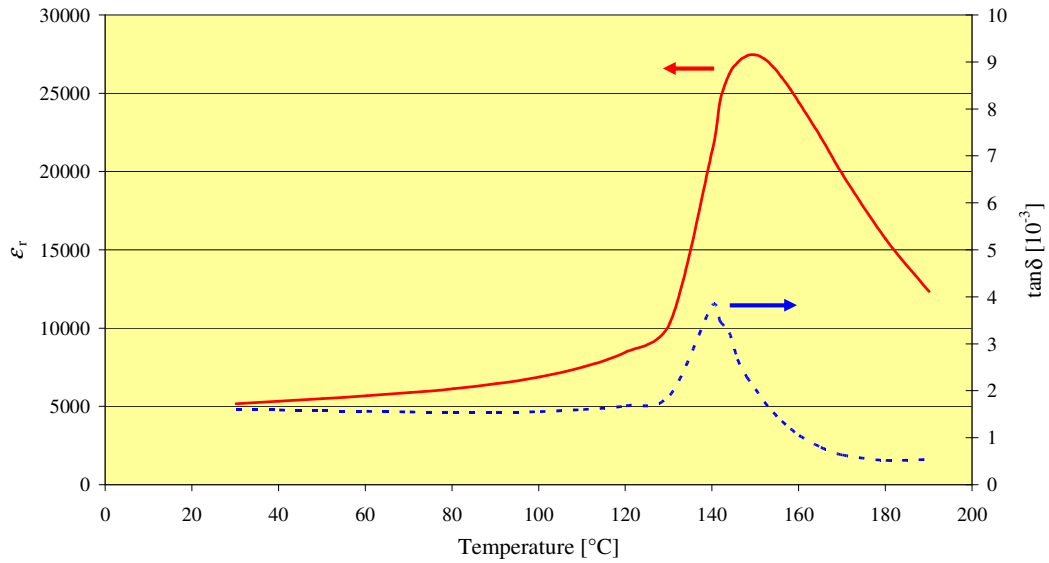


Microstructure of Pz59 at a magnification of 1000 times



Microstructure of Pz59 at a magnification of 2000 times

The structure is homogeneous and dense with a grain size of 2-10 microns



Permittivity and dielectric loss tangent as a function of temperature. The curie point is 150°C