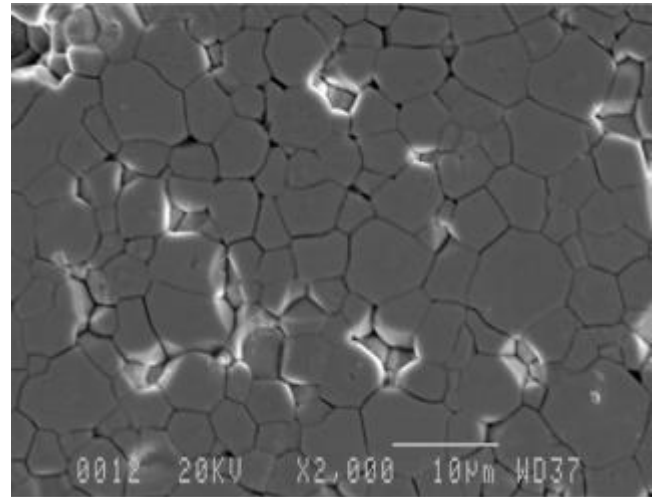


DATA SHEET

# Modern relaxor type PNN-PZT

## Type Pz59



Microstructure of Pz59 at a magnification of 5000 times

### 01 Description

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.

#### 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.

### 02 Key features and benefits

- Lowest batch to batch variation in the industry
- Stable material with consistent performance
- Customised or standard designs
- High operating temperature
- High permittivities
- High mechanical  $Q_m$  values
- Low dielectric losses

### 03 Applications

- Linear arrays for medical imaging
- 1-3 composites for medical imaging
- 1-3 composites for imaging application in sonar systems
- 1-3 composites for imaging application in NDT systems

### 04 Contact

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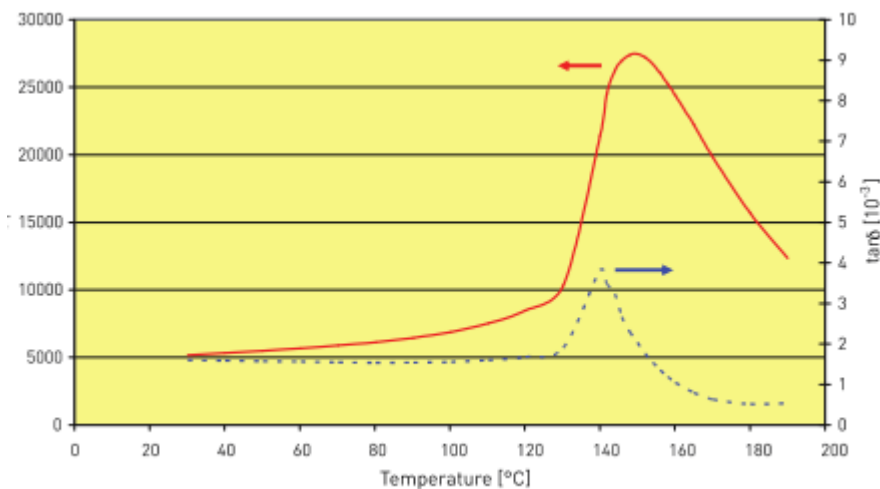
Modern relaxor type PNN-PZT, Type Pz59

05 Material properties

Electrical	Symbol	Pz59
Relative dielectric permittivity at 1 kHz	$K_{33T}$	5100
Dielectric dissipation factor at 1 kHz	$\tan\delta$	$18 \times 10^{-3}$
Curie temperature	$T_C >$	150 °C
Recommended working range	$<$	80 °C
Electromechanical		
Coupling factors	$k_p$	55
	$k_t$	46
Piezoelectric charge coefficient	$d_{33}$	645 pC/N
	$N_t$	2020 Hz m
Mechanical		
Mechanical Quality Factor	$Q_{m,t}^E$	40
Density	$\rho$	7.9 g/cm <sup>3</sup>

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.

06 Technical performance



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