

New Material Advances Extreme High-Temp Applications

Ultra High-Temperature Ceramic Provides Piezoelectric Stability and Performance in Extreme Environments

Piezo Technologies' new K-12 Ultra High-Temp Piezoelectric Ceramic is the most advanced material available for high-temperature applications. After more than two years of R&D, this new modified bismuth titanate material is set to advance the state of sensors, accelerometers, transducers, and more.

K-12 offers the following benefits:

- Specifically designed for stable piezoelectric activity in extreme high temperature applications; up to 1100°F (593°C) continuous use or up to 1400°F (760°C) intermittent use.
- Unmatched high Curie temperature of greater than 820°C.
- Extremely stable piezoelectric activity at very high temperatures.
- Markets include under-hood automotive, down-hole data logging in the oil field, geothermal applications, near-engine aerospace electronics, defense and industrial instrumentation, etc.

K-12 PHYSICAL & ELECTRICAL PROPERTIES

K_{33}^T	Free Dielectric Constant	145
K_{33}^S	Clamped Dielectric Constant	140
k_{33}	Longitudinal Coupling Coefficient	0.12
k_{31}	Transverse Coupling Coefficient	0.02
k_{15}	Shear Coupling Coefficient	0.075
k_t	Thickness Coupling Coefficient	0.12
k_p	Planar Coupling Coefficient	0.07
d_{33}	Piezoelectric Strain Constant ($\times 10^{-12}$ m/V)	12
d_{31}	Piezoelectric Strain Constant ($\times 10^{-12}$ m/V)	-5
d_{15}	Piezoelectric Strain Constant ($\times 10^{-12}$ m/V)	10
g_{33}	Piezoelectric Voltage Constant ($\times 10^{-3}$ Vm/N)	9.4
g_{31}	Piezoelectric Voltage Constant ($\times 10^{-3}$ Vm/N)	-4.0
g_{15}	Piezoelectric Voltage Constant ($\times 10^{-3}$ Vm/N)	6.7
s_{33}^E	Compliance at Constant Field ($\times 10^{-10}$ m ² /N)	9.5
Q_m	Mechanical Q (Thickness)	200
Q_r	Mechanical Q (Radial)	750
Y_{33}^E	Young's Modulus at Constant Field ($\times 10^{-10}$ N/m ²)	10.5
D	Dissipation	0.004
N_t	Thickness Frequency Constant (kHz-in)	89
	Thickness Frequency Constant (Hz-m)	2260
N_p	Planar Frequency Constant (kHz-in)	96
	Planar Frequency Constant (Hz-m)	2438
ρ	Density (g/cm ³)	6.9
Z_A	Acoustic Impedance (MRayl)	28.5
V_s	Sound Velocity (m/sec)	4100
T_c	Curie Temperature (°C)	820
d_{ave}	Average Grain Size (μ m)	5 to 10



Advanced Piezo Materials & Custom Transducers/Arrays

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Kézite K-12