

Main Materials of Piezoelectric Ceramics

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压电陶瓷主要材料性能参数表																				
Performance parameter table of main materials for piezoelectric ceramics																				
材料 型号 Model	机电耦合系数 Coupling factors				介电 常数 Dielectric constants	介电 损耗 Dielectric loss	压电常数 Piezoelectric constant				弹性柔顺 常数 Elastic compliance constant	机械品质 因数 Mechanical quality factor	声速 Sound velocity (m/s)				体积 密度 Volume density	居里 温度 Curie point	杨氏 模量 young modulus	泊松比 Poisson ratio
	Kp	K31	k33	Kt	T ε _r	Tg δ%	d31 (10 ⁻¹² m/v)	d33 (10 ⁻¹² m/v)	g31 (10 ⁻³ v/m/n)	g33 (10 ⁻³ v/m/n)	S ¹¹ (10 ⁻¹² m ² /n)	Qm	Vd	V1	V3	Vt	ρ (10 ³ kg/m ³)	Tc (°C)	Y ^E 10 ⁹ N/m ²	σ ^E
PZT-51	0.62	0.35	0.68	0.50	2200	2	-186	500	-9.6	25.6	16.7	80	3000	2900	3800	4500	7.6	270	60	0.36
PZT-52	0.63	0.35	0.70	0.50	2400	2	-204	520	-9.8	24.5	17	75	3000	2900	3800	4000	7.6	270	59	0.36
PZT-53	0.64	0.36	0.70	0.50	2600	2	-227	550	-9.9	23.9	17.4	75	2950	2830	3510	3950	7.6	270	57.5	0.36
PZT-5H	0.68	0.38	0.76	0.52	3200	2	-275	620	-9.7	22	18	70	2850	2800	3100	3900	7.5	230	56	0.36
PSnN-5	0.60	0.35	0.68	0.50	1600	2	-170	400	-12	28	16.6	85	3100	2950	3650	4000	7.5	350	60	0.36
PZT-5X	0.70	0.40	0.77	0.53	4500	2	-300	750	-7.5	18.8	19	65	2850	2800	3100	3850	7.5	165	53	0.39
PLiS-51	0.62	0.35	0.70	0.52	2000	2	-197	450	-11.1	25.4	18	80	3100	2950	3850	4500	7.5	345	56	0.36
PZT-41	0.58	0.32	0.66	0.48	1050	0.3	-106	260	-11.4	28	11.8	1000	3475	3300	3900	4200	7.5	320	85	0.3
PZT-42	0.58	0.33	0.67	0.48	1250	0.4	-124	280	-11.2	25.3	12.7	800	3380	3240	3800	4160	7.5	320	79	0.3
PZT-43	0.58	0.34	0.68	0.48	1420	0.5	-138	300	-11	24	13.2	600	3360	3200	3750	4150	7.5	320	76	0.3
PZT-82	0.52	0.30	0.57	0.40	1100	0.3	-100	240	-10.3	25	11.6	1200	3500	3500	3900	4200	7.6	310	86	0.3
PZT-83	0.61	0.35	0.72	0.46	1527	0.4	-146	320	-10.8	23.6	13.02	2000	3242	3178	4003	4570	7.6	312	77	0.34
PCrN-4	0.60	0.35	0.68	0.45	1600	0.6	-156	350	-11	24.7	14	400	3300	3100	3700	4100	7.5	310	71	0.3
PBaS-4	0.59	0.34	0.68	0.49	1900	0.5	-160	380	-9.5	22.6	13.2	2200	3400	3200	3700	4250	7.5	310	76	0.33
PZTSS-7	0.54	0.32	0.64	0.5	1800	1.5	-160	360	-9.4	22.6	14.8	80	3070	3000	3600	4500	7.6	350	67.5	0.36
GW	—	—	—	0.35	370	0.5	—	90	—	27.4	—	—	—	—	—	3585	5.75	475	—	—
BaTiO3	0.34	0.196	0.43	0.32	1260	0.5	-60	160	-5.4	14.3	8.4	1200	4800	频率常数 Frequency constant NP3180 N12280		5350	5.6	115	119	0.33

Product Description

Zibo Yuhai Electronic Ceramic Co., Ltd.

Opening a New Era of Piezoelectric Ceramics · Embarking on a New Industrial Journey

Zibo Yuhai Electronic Ceramic Co., Ltd. is located at No. 57 Chuangye Avenue, Boshan Development Zone, Zibo City. Founded in 1966, it was restructured from the state-owned Zibo Radio Ceramic Components Factory into Zibo Yuhai Electronic Ceramic Co., Ltd. in November 2001. The company is a professional manufacturer of piezoelectric ceramic elements, a founding member of the China Electronic Components Industry Association, and a council unit of the Shandong Advanced Ceramics Innovation and Entrepreneurship Community.

The company's leading products are piezoelectric ceramic components and sensors, with an annual production capacity of 3.5 million pieces. Built on 60 years of accumulated proprietary expertise in piezoelectric ceramics, the company holds more than 30 functional material formulations and a product system of over a thousand varieties that meets users' differentiated needs, holding a technologically leading position in China's piezoelectric ceramics field. Every year it provides quality products and services to more than 400 enterprises across dozens of industries — underwater acoustics, electroacoustics, ultrasonics, metrology, communications, detection, automatic control, medical care, ignition and detonation, and more. Some products are exported abroad.

The company has established a municipal-level Engineering Laboratory for Piezoelectric Ceramics and Devices and a municipal-level "One Enterprise, One Technology" R&D Center. Its independently developed "Research on Cobalt-Aluminum Co-Doped Barium Titanate Piezoelectric Ceramics" and "Research on High-Curie-Temperature, High-Stability Lead Antimony Niobium Zirconate Titanate Piezoelectric Ceramics" passed Zibo municipal scientific achievement appraisal, filling domestic gaps and reaching internationally advanced levels; the related projects have successively won the third prize of Zibo Science and Technology Progress Award, the third prize of Zibo Technical Invention Award, and the first prize of Shandong Technical Invention Award. The "Zibo Brand" piezoelectric crystals were awarded "Well-Known Brand in China's Electronic Industry" by the China Electronic Quality Management Association.

The company participated in formulating two ministerial standards — "General Technical Specifications for Piezoelectric Ceramic Materials for Underwater Acoustics" CB1125-1128-86 and "Common Piezoelectric Ceramic Elements for Underwater Acoustics" CB1218-93 — and led the formulation of the group standard "Spherical Piezoelectric Ceramic Transducers". Since 2020, it has participated in formulating a number of group standards, including "Generic Specification for Stacked Piezoelectric Ceramic Actuators", "Lead-Free Piezoelectric Ceramic Atomizing Elements", "Lead-Free Piezoelectric Ceramic Electroacoustic Elements", "Dielectric Properties of Microwave Dielectric Ceramic Powders", "High-Temperature Piezoelectric Acceleration Sensors", and "Piezoelectric Ultrasonic Sensors for Intelligent Cleaning Robots".

The company has passed ISO9001 and IATF16949 quality management system certifications, and has obtained 7 invention patents and 9 utility model patents. It was recognized as a National High-Tech Enterprise in 2016, a Shandong "Specialized, Refined, Distinctive and Innovative" enterprise in 2019, and a Shandong Gazelle Enterprise in 2021, and received the Shandong Manufacturing "Lu Chain Premium Product" certification in 2025.