

High Performance Ferroelectric and Piezoelectric Single Crystals: PMN-PZT, PMN-PT, BaTiO₃ [Fe/Mn/La/Nb-doped], Ba(Zr,Ti)O₃, and BCT-BZT

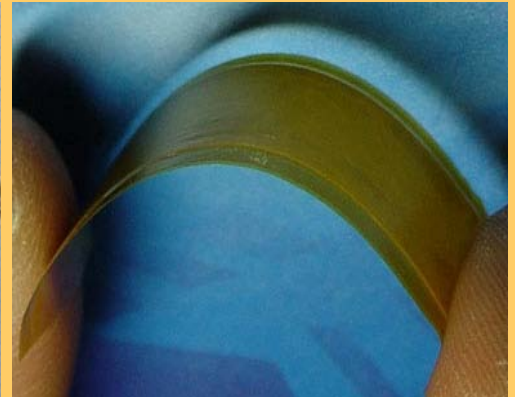
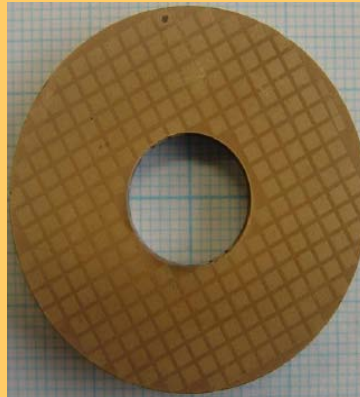
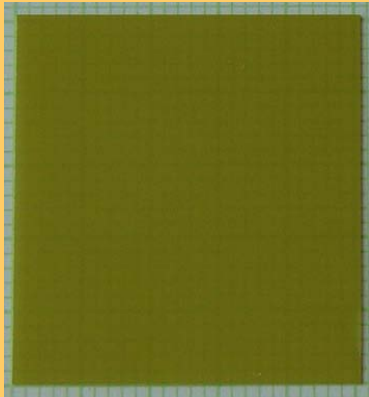
Ceracomp Co. Ltd. has produced piezoelectric PMN-PT and PMN-PZT single crystals, which are fabricated by the cost-effective solid-state crystal growth (SSCG) method. Their excellent dielectric and piezoelectric properties make them the best candidates for sensors, transducers, actuators, energy harvesters, and single crystal-epoxy composites. PMN-PT and PMN-PZT single crystals are available with lateral dimensions up to 65 mm. High T_C ($T_C > 210^\circ\text{C}$) or high Q_m ($Q_m > 1,000$) PMN-PZT single crystals are also available by request.

Single Crystal
Wafer

Single Crystal
Wedge

"1-3" Single Crystal
Composite (Ring)

"Flexible" Single Crystal
Fiber Composite



Typical Properties of (001) PMN-PZT [Pb(Mg_{1/3}Nb_{2/3})O₃-Pb(Zr,Ti)O₃] Single Crystals

Ceracomp Single Crystals	DPSC 150-85	LCSC 145-90	CPSC 160-95	CPSC 180-120	CPSC 200-145	HPSC 150-95	HPSC 180-120	HPSC 200-145	HPSC 210-165
K^T [$\epsilon_{33}^T/\epsilon_0$]	10,000	5,500	7,000	6,000	4,500	5,000	4,000	3,500	3,000
$\tan \delta$ [%]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.5	< 0.5	< 0.5	< 0.5
T_C [$^\circ\text{C}$]	150	145	160	180	200	150	180	200	210
T_{RT} [$^\circ\text{C}$]	85	90	95	120	145	95	120	145	165
k_{33}	0.94	0.9	0.93	0.92	0.91	0.91	0.91	0.9	0.88
d_{33} [pC/N]	3,000	1,500	2,000	1,850	1,500	1,450	1,300	1,100	900
k_{32} (011)	0.92	0.87	0.91	0.9	0.9	0.89	0.88	0.86	0.85
d_{32} [pC/N] (011)	-2,500	-1,350	-1,850	-1,650	-1,400	-1,350	-1,200	-900	-700
E_C [kV/cm]	3	3	4	4	5	5	5	6	6
Q_m	100	100	100	100	100	> 500	> 500	> 1,000	> 1,000

Please visit "www.ceracomp.com".