

CTS Piezoceramic Materials - PZT

Technical Standards

Material	GENELEC EN 50324-1	NAVY 1376A	Industrial
<u>3195HD</u>	200	II	5A
<u>3195STD</u>	200	II	5A
<u>3203HD</u>	600	VI	-
<u>3203STD</u>	600	VI	5H
<u>3221HD</u>	600	VI	5H
<u>3222HD</u>	600	V	5J
<u>3241HD</u>	600	VI	-
<u>3257HD</u>	600	VI	-
<u>K1000</u>	300	III	8
<u>K1100</u>	300	III	8
<u>K1300</u>	100	I	4D
<u>K1450</u>	100	I	-
<u>NCE40</u>	100	I	4D
<u>NCE41</u>	100	I	4D
<u>NCE51</u>	200	I	5A
<u>NCE55</u>	600	VI	-
<u>NCE56</u>	600	VII	5H
<u>NCE81</u>	300	III	8
<u>Pz21</u>	600	VI	-
<u>Pz23</u>	-	-	-
<u>Pz24</u>	500	-	7A
<u>Pz26</u>	100	I	4D
<u>Pz27</u>	200	II	5A
<u>Pz29</u>	600	VII	5H

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Material	GENELEC EN 50324-1	NAVY 1376A	Industrial
Pz34	700	-	2
Pz36	-	-	-
Pz37	-	-	-
Pz39	-	-	-
Pz54	-	-	-
Pz59	600	VI	-
Pz89	300	III	8
Pz94	-	-	-

CTS Piezoceramic Materials - Lead-Free

Technical Standards

Material	GENELEC EN 50324-1	NAVY 1376A	Industrial
LF22	-	-	-
LF41	-	-	-
LF51	-	-	-
LF52	-	-	-
Pz12	-	-	-
Pz12X	-	-	-
Pz46	-	-	K15
Pz48	-	-	-
Pz62	-	-	-

CTS Piezoelectric Material Applications

Material Category	Soft					Very soft			Single Crystal	
Materials	Pz27, 3195STD, 3195HD, NCE51	Pz29,3222HD, NCE56	LF22 (Lead-Free)	LF41 (Lead-Free)	Pz62* (Lead-Free)	Pz21, 3203STD, 3221HD, 3203HD, 3241HD	Pz94	NCE55, 3257HD	PMN-PT	PIN-PMN-PT
Underwater and Defense										
Transmitters (High Power)										X
Receivers, Hydrophones	X	X	X	X	X	X			X	X
Generator (Fuze)	X	X								
Medical										
Therapeutic (HIFU/HITU, Surgery, Dental)										
Diagnostic (Imaging, IVUS)	X	X		X	X	X	X	X	X	X
Combined, Doppler	X	X		X	X	X				X
Implantable Devices (Hearing Aids, Pacemakers, Valves etc.)	X	X	X	X					X	
Industrial										
Non-Destructive Testing	X	X	X	X	X	X	X			
Transducers (Flow, Level)	X	X	X		X					
Sensors (Shock, Acceleration)	X			X	X					
Acoustic Emission	X	X		X		X				
Actuators (Positioning, Valves, Inkjet)	X	X	X	X						
High Power Ultrasound (Cleaning, Cutting, Welding)										

*Material in advanced development stage.

CTS Piezoelectric Material Applications

Material Category	Hard				HIFU		Low Acoustic Impedance	
	Pz24	Pz89, K1000, NCE81, K1100	Pz26, K1300, NCE40, NCE41, K1450	Pz12*, Pz12X*, LF51, LF52 (Lead-Free)	Pz34	Pz54	Pz36	Pz37, Pz39
Underwater and Defense								
Transmitters (High Power)	x	x	x	x	x	x	x	
Receivers, Hydrophones								x
Generator (Fuze)			x					
Medical								
Therapeutic (HIFU/HITU, Surgery, Dental)	x	x	x	x	x	x	x	
Diagnostic (Imaging, IVUS)								
Combined, Doppler								
Implantable Devices (Hearing Aids, Pacemakers, Valves etc.)								
Industrial								
Non-Destructive Testing					x		x	x
Transducers (Flow, Level)								x
Sensors (Shock, Acceleration)								
Acoustic Emission								
Actuators (Positioning, Valves, Inkjet)			x					
High Power Ultrasound (Cleaning, Cutting, Welding)	x	x	x	x	x	x		

*Material in advanced development stage.