

# **Global (North America, Europe, Asia-Pacific, South America, Middle East and Africa) Piezoelectric Ceramics Market 2018, Forecast to 2023**

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## **Abstracts**

The piezoelectric ceramic is a kind of functional ceramic materials which can create electricity when subjected to a mechanical stress. They will also work in reverse, generating a strain by the application of an electric field. In sensors they make it possible to convert forces, pressures and accelerations into electrical signals, and in sonic and ultrasonic transducers and actuators they convert electric voltages into vibrations or deformations.

### **The Science**

Piezoelectric ceramic materials are ionically bonded and consist of atoms with positive and negative charges, called ions. These ions occupy positions in specific repeating units (called unit cells). If a unit cell is non-centro symmetric, i.e. lacking a centre of symmetry, then the application of a stress produces a net movement of the positive and negative ions with respect to each other and results in an electric dipole or polarisation. The degree of polarisation is dependent upon the stress and whether tensile or compressive stresses are applied affects the charge produced. The dipoles, which are present due to the non-centro symmetric structure, form domains that are regions where neighbouring dipoles have the same alignment.

Initially the domains are randomly oriented (see figure on the left) and there is no overall polarisation of the ceramic and therefore it exhibits no piezoelectric effect. By applying heat and a strong DC field the domains are subjected to 'poling', causing the domains that are nearly aligned to the field to grow at the expense of those at differing alignments. After cooling to room temperature and removing the DC field, the domains are 'locked' resulting in an overall alignment and the material is now piezoelectric.

### **SCOPE OF THE REPORT:**

This report focuses on the Piezoelectric Ceramics in global market, especially in North America, Europe and Asia-Pacific, South America, Middle East and Africa. This report categorizes the market based on manufacturers, regions, type and application. The market for Lead Magnesium Niobate (PMN) held the largest share of the piezoelectric materials market owing to their high piezoelectric sensitivity and ability to acquire desired shapes and sizes. Currently, the most widely used piezoelectric ceramic material is PMN. It is used in a variety of applications, including medical, industrial, and automotive.

In the global piezoelectric devices market, APAC held the highest share in 2015. Globally, the largest amount of research on piezoelectric materials and devices is undertaken in Japan. Several experiments on microscale applications of piezoelectric technology have been carried out in Japan, including the usage of this technology in floors of train stations to generate electricity. Owing to this, the market in APAC is expected to grow at the highest rate in the coming years.

Global giant manufactures mainly distributed in Europe. The manufacturers in Japan have a long history and unshakable status in this field. Manufacturers such as MURATA and TDK have relative higher level of product's quality. As to British, MORGAN has become as a global leader. In Germany, CeramTec leads the technology development. Most of Chinese manufactures locate in Jiangsu, Guangdong and Zhejiang province.

The worldwide market for Piezoelectric Ceramics is expected to grow at a CAGR of roughly 4.0% over the next five years, will reach 9850 million US\$ in 2023, from 7780 million US\$ in 2017, according to a new GIR (Global Info Research) study.

Market Segment by Manufacturers, this report covers

MURATA

TDK

MORGAN

TAIYO YUDEN

KYOCERA

CeramTec

PI Ceramic

Exelis

Sparkler Ceramics

KEPO Electronics

APC International

TRS

Noliac

SensorTech

Meggitt Sensing

Johnson Matthey

Kinetic Ceramics

Konghong Corporation

Jiakang Electronics

Datong Electronic

Audiowell

Honghua Electronic

Risun Electronic

Yuhai Electronic Ceramic

PANT

Market Segment by Regions, regional analysis covers

*Global (North America, Europe, Asia-Pacific, South America, Middle East and Africa) Piezoelectric Ceramics Mar...*

North America (United States, Canada and Mexico)

Europe (Germany, France, UK, Russia and Italy)

Asia-Pacific (China, Japan, Korea, India and Southeast Asia)

South America (Brazil, Argentina, Colombia etc.)

Middle East and Africa (Saudi Arabia, UAE, Egypt, Nigeria and South Africa)

Market Segment by Type, covers

Lead zinc titanates(PZT)

Lead titanate (PT)

Lead magnesium niobate (PMN)

Others

Market Segment by Applications, can be divided into

Industrial & Manufacturing

Automotive

Information & Telecommunication

Medical Devices

Others

There are 15 Chapters to deeply display the global Piezoelectric Ceramics market.

Chapter 1, to describe Piezoelectric Ceramics Introduction, product scope, market overview, market opportunities, market risk, market driving force;

*Global (North America, Europe, Asia-Pacific, South America, Middle East and Africa) Piezoelectric Ceramics Mar...*

Chapter 2, to analyze the top manufacturers of Piezoelectric Ceramics, with sales, revenue, and price of Piezoelectric Ceramics, in 2016 and 2017;

Chapter 3, to display the competitive situation among the top manufacturers, with sales, revenue and market share in 2016 and 2017;

Chapter 4, to show the global market by regions, with sales, revenue and market share of Piezoelectric Ceramics, for each region, from 2013 to 2018;

Chapter 5, 6, 7, 8 and 9, to analyze the market by countries, by type, by application and by manufacturers, with sales, revenue and market share by key countries in these regions;

Chapter 10 and 11, to show the market by type and application, with sales market share and growth rate by type, application, from 2013 to 2018;

Chapter 12, Piezoelectric Ceramics market forecast, by regions, type and application, with sales and revenue, from 2018 to 2023;

Chapter 13, 14 and 15, to describe Piezoelectric Ceramics sales channel, distributors, traders, dealers, Research Findings and Conclusion, appendix and data source

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