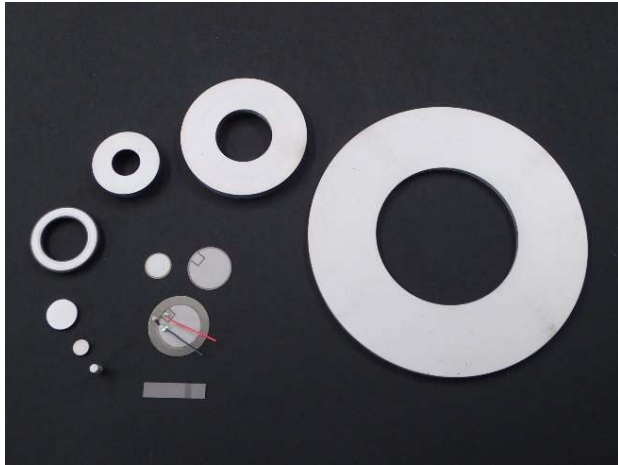


Lead-free piezoelectric ceramics



■ What are the features of the product?

An insulating material which generates electricity when force is applied and which is deformed and oscillates when electricity is applied is referred to as a piezoelectric material. A piezoelectric material made from ceramics is referred to as piezoelectric ceramics.

Piezoelectric ceramics, which can convert force into electric energy and vice versa, are widely used in familiar devices, such as ultrasonic sensors, industrial actuators, industrial ultrasonic transducers, ultrasonic medical devices, buzzers, passive sensors, and haptic devices. However, the materials used for such devices contain lead, which is a heavy metal and may affect the environment and our health. Thus, we have developed lead-free piezoelectric ceramics.



■ Why was the product certified as one of the Nittoku Green Products?

Resource saving

Energy saving

Substance of Concern

Lead-free piezoelectric ceramics were also developed by other manufacturers, but their piezoelectric characteristics, thermal resistance, and thermal cycle reliability were lower than those of lead zirconate titanate (PZT), which is conventional lead-containing piezoelectric ceramics. Most of them could not withstand practical use.

Our lead-free piezoelectric ceramics have been improved to cope with these issues.

■ Comment from the developers

When we analyzed the life cycle of widely used PZT products, we considered that the impact of consumption of a huge amount of lead on the environment and the human body were not negligible and wondered if it is sustainable to continue to use lead by placing top priority on performance, convenience, and cost.

After steady R&D efforts for about 20 years from basic research, we have succeeded in developing lead-free piezoelectric ceramics. The scope of application is still limited, but we are confident that we have finally developed marketable lead-free piezoelectric ceramics.

We will further improve the ceramics and market new products so that they can be used in various applications. We hope that the widespread use of our products will contribute to the health and well-being of people and realization of a sustainable global environment and human society.

Achieving characteristics on the practical level depending on the application

