

#Piezoceramics

Piezoceramics now lead-free

Plochingen, October 2024

CeramTec, the high-performance ceramics specialist, has developed a BNT-BT based piezo ceramic that offers similar performance to conventional PZT piezoceramics for many applications, but with one major advantage: it does not contain lead.

- **Innovative: Piezoceramics without Pb**
- **Sustainable: BNT-BT enables lead-free water networks**
- **Exciting: CeramTec presents BNT-BT solutions at the Enlit in Milan**

Piezoceramics are indispensable for a wide range of applications such as smart metering solutions for water, heat and gas. Here, piezoceramic components are the basis for high-precision, stable and durable ultrasonic flow sensors. In all these applications, piezoceramics convert mechanical excitation such as pressure and acceleration into electrical signals – or vice versa. They then convert electrical signals into mechanical motion or vibrations. Until now, piezoceramics have only been able to do this because of their lead basis – now CeramTec has a lead-free alternative for many piezoceramic applications.

A powerful substitute

The fact that piezoceramics are based on lead zirconate titanate (PZT) was practically taken for granted. The crystalline structure of this material ensures the enormous stability of piezoceramics. After intensive development work, CeramTec has now formulated an alternative with a proprietary blend of next generation of materials: solid solution bismuth sodium titanate-barium titanate (BNT-BT). BNT-BT is suitable for sensor applications in which the material is set to a thickness vibration mode, i.e. the vibration runs along the thickness of the material and perpendicular to the surface.

Ready for use in the energy sector

CeramTec's BNT-BT formulation is therefore particularly suitable for use in piezoceramic ultrasonic flow sensors for ultrasonic water meters, for measuring domestic or large-scale consumption. In this way,

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CeramTec contributes to the goal of making water networks completely lead-free.

Other possible applications for BNT-BT include proximity and level measurements in environmental conditions below 130°C or ultrasonic bubble detection systems in medical technology. It is also suitable for use in high-performance stacked transducers.

CeramTec will be showcasing its lead-free piezo ceramic solutions from 22 to 24 October 2024 at Enlit Europe in Milan (Booth 6.A10), the trade fair for the European energy industry.

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Image material

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CeramTec_leadfree-piezo.jpg

Lead-free piezoceramic components in different shapes, sizes and designs. Available for certain smart metering or high-power applications.

Source: CeramTec



CeramTec_ultrasonic-flow-management.jpg

Ultrasonic flow management solution for residential gas metering - one of the latest innovations CeramTec is presenting alongside its lead-free piezoceramic solutions at Enlit 2024 in Milan.

Source: CeramTec



CeramTec_ultrasonic-flow-sensor.jpg

Everything from a single source: CeramTec develops and manufactures its own piezoceramic ultrasonic flow sensors for high volume manufacture – based on conventional or lead-free piezoceramic components.

Source: CeramTec

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Meta Description

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About CeramTec

CeramTec has been a supplier and manufacturer of technical ceramics since 1903, specialising in high-performance ceramics (HPC) solutions and in the development, manufacture and distribution of parts, components and products made of ceramic materials. With more than a century of development and production experience in the HPC industry, CeramTec is a world leader in the manufacture of advanced ceramics and develops these materials for use in a wide range of applications. CeramTec's advanced ceramics are used in a number of areas, including medical applications such as hip prostheses, other orthopaedic implants, dental implants and medical devices, as well as in the mobility and electronics industries and other industrial applications. With production sites and subsidiaries in Europe, North and South America and Asia, CeramTec is present as a manufacturer and supplier all over the world. CeramTec's headquarters are located in Plochingen near Stuttgart. In 2023, CeramTec generated revenue of approx. 817 million euros. CeramTec employs more than 3,800 people worldwide, including around 2,000 in Germany.

More info: www.ceramtec-group.com

