75 Years of Piezo Technology

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How Innovations from Germany Are Conquering World Markets

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**Piezoceramics have an extremely broad range of applications, including in medical and industrial sensor technology, as well as power, sound, pressure, and dispensing applications. Seventy-five years ago, the first scientific report on the properties, technology, and known applications of piezo ceramics was compiled at the ceramic manufacturing plant of HESCHO-Kahla in Hermsdorf, Germany. At the same time, the first range of materials was developed under the name “Piezolan.” To celebrate this anniversary, PI Ceramic organized a symposium on the history, present, and future of this versatile, innovative material in collaboration with the Verein für Regional- und Technikgeschichte e.V. Hermsdorf, Germany, which is dedicated to preserving the history of the region and its technological achievements.**



*Caption: Dr. Dieter Grützmann, a member of the board of the Verein für Regional- und Technikgeschichte e.V. Hermsdorf, reports on the development of piezoceramics in Germany after 1945. Photo: Sebastian Reuter*

We encounter piezoelectric ceramics, also known as “piezos,” in many places in everyday life, for example, in lighters or gas stoves. The principle is always the same: Mechanical pressure on the component generates an electrical voltage that ignites the gas with a spark when discharged. This effect can also be utilized in reverse as piezoceramics change their length when an electrical voltage is applied. This enables various applications, such as generating ultrasound or constructing miniaturized, highly precise pumps, actuators, and motors.

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In 1950, HESCHO-Kahla published a scientific report detailing the state of knowledge about the material at the time and developed the first range of piezoceramic materials under the name “Piezolan.” Thus, piezo technology was established in Germany at almost the same time as international developments. Since then, a German competence center for piezo technology has emerged in the region around the Hermsdorfer Kreuz interchange, and it still exists there today. Therefore, it is no coincidence that PI Ceramic was founded in the middle of this region, in the village of Lederhose, Germany, in 1992. PI Ceramic was originally intended to supply its parent company Physik Instrumente (PI), which is now the global market leader in high-precision positioning systems based on piezo actuators. Today, PI Ceramic supplies customers around the globe with piezoceramic components for the full range of modern applications of piezo technology, including piezoceramic tubes for picoliter-precise dosing of liquids such as medicines or printing inks, rings for nebulization in inhalers, or discs for generating ultrasound, among others. With over 400 employees, PI Ceramic is one of the largest employers in the region.

Symposium on May 14, 2025, in Lederhose

At PI Ceramic’s modern customer and visitor center, renowned speakers presented the technological history of piezoceramics as well as the latest material and application developments. These speakers included Dr. Dieter Grützmann from the board of Verein für Regional- und Technikgeschichte e.V. Hermsdorf, Prof. Dr. Jörg Töpfer from University of Applied Sciences Jena, and Prof. Dr.-Ing. Jörg Wallaschek from Leibniz University Hannover.



*Caption: In an interview with Dr. Patrick Pertsch (left), contemporary witnesses such as retired PI Ceramic Managing Director Adolf Bauer (right) provided insights into the early years of PI Ceramic. Photo: Sebastian Reuter*

Prof. Töpfer illustrated the economic importance of piezoceramics based on an evaluation of a market study: “The study shows a global sales volume of 1.4 billion U.S. dollars for 2023, with a growth rate of approximately 4.9 %.”

Professor Wallaschek, an expert in piezo applications, explained some current applications of piezo technology, such as common rail injection systems, without which modern diesel engines would be unable to meet the Euro 6 emissions standard, or wire bonding in the semiconductor industry. For the future, Wallaschek sees many new applications, including drilling on Mars or levitation using ultrasound.

PI Ceramic Managing Director Dr. Patrick Pertsch emphasizes: “It is fascinating to support modern, future-oriented applications of piezoceramics every day with PI Ceramic’s diverse expertise, even though the material has been around for seventy-five years.”



*Caption: Pleased with a successful event: Dr. Patrick Pertsch, Managing Director PI Ceramic (in the middle) as well as the professors Dr.-Ing. Jörg Wallaschek (Leibniz University Hannover, on the right) and Dr. Jörg Töpfer (University of Applied Sciences Jena, on the left). Photo: Sebastian Reuter*

PI Ceramic in Brief

Redefining the limits of what can be measured and moved, together with our customers: As a worldwide partner with over thirty years of expertise and more than 400 employees, PI Ceramic develops and manufactures piezoceramic components and subsystems for applications in the areas of medical technology, industrial ultrasonic sensors, and precision dosing. One hundred engineers develop customized solutions and provide advice and expertise. PI Ceramic is part of the PI Group, the innovation and market leader in high-precision positioning technology.

About the Verein für Regional- und Technikgeschichte e.V. Hermsdorf

Since its foundation in 1991, the association has been committed to documenting and reevaluating the region’s technological history. This history is closely tied to electroceramics, which were developed and manufactured by the former state-owned enterprise, Keramische Werke Hermsdorf, and its predecessor and successor companies. The association currently has twenty-five active members and operates a technical collection featuring a permanent exhibition at Hermsdorf Town Hall (www.vrtg.de).