

Power Ultrasonic Transducers

**Energy-Efficient Sonification for
Life Science and Industrial Applications**



Piezo-Driven Power Ultrasound

Power ultrasonic transducers, such as the Langevin transducer, can be used in a wide variety of applications in the fields of industry and life sciences. High-quality piezoelectric rings create ultrasonic waves in the transducer which are amplified until they reach the device's peak, hence triggering vibrations in the target media.

Together with customers, PI Ceramic develops Langevin transducers suitable for the respective application. In doing so, the focus is on high mechanical quality and low power consumption. As our highly qualified team oversees all process steps, we can implement customer-specific adaptations in the shortest possible time, and with the highest quality. In addition to providing consulting during the design and development process, as well as manufacturing the transducer, PI Ceramic also provides driver electronics.

Supporting applications in medical technology such as

- Sample preparation & cell lysis
- Ultrasonic mixing & homogenization
- Phacoemulsification
- Ultrasonic scalpels
- Tissue aspiration
- Tartar removal

Supporting industrial applications such as

- Ultrasonic atomization
- Welding, drilling, and cutting
- Ultrasonic cleaning

Key features of the power ultrasonic transducer

- High frequency
- High peak-to-peak displacement
- Low power consumption
- High quality factor

Customized Transducer Designs

Special applications mean unique requirements. With more than thirty years of piezo expertise, PI Ceramic creates complete solutions of the highest quality. In order to develop the best possible piezo systems, PI Ceramic provides virtual prototypes before actually manufacturing the subsystems or complete solutions: Simulations enable us to come to an agreement with our customers more quickly, more precisely, and more economically.

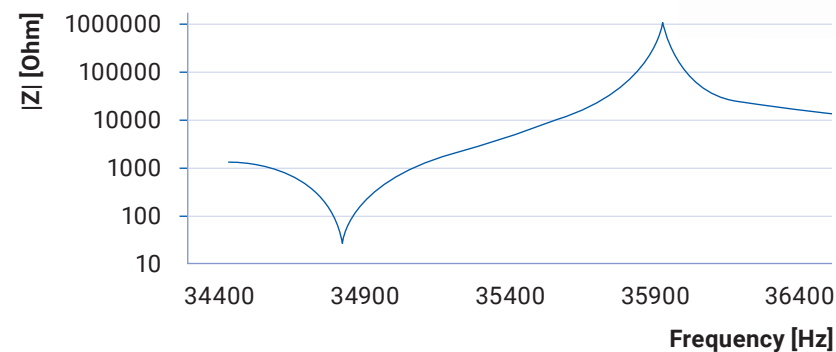
Tailor-made acoustic transducer performance is critical for the implementation of automated and efficient workflows with ultrasound equipment. The following parameters of our power ultrasonic transducer are modifiable:

- Transducer materials
- Resonant frequency
- Vibration amplitude
- Power consumption



Example Specifications and Performance for an Ultrasonic Transducer Used to Blend Cell Suspensions:

Resonant frequency f [kHz]	35
Resonant impedance I [Ω]	<50
Maximum peak-to-peak displacement A_{pp} [μm]	40
Maximum power consumption P [W]	5
Quality factor Q_m	>2000



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