Ultrasonic Transducers: Materials and Design for Sensors, Actuators and Medical Applications (Woodhead Publishing Series in Electronic and Optical Materials)

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Ultrasonic transducers are key components in sensors for distance, flow and level measurement as well as in power, biomedical and other applications of ultrasound. Ultrasonic transducers reviews recent research in the design and application of this important technology.

Part one provides an overview of materials and design of ultrasonic transducers. Piezoelectricity and basic configurations are explored in depth, along with electromagnetic acoustic transducers, and the use of ceramics, thin film and single crystals in ultrasonic transducers. Part two goes on to investigate modelling and characterisation, with performance modelling, electrical evaluation, laser Doppler vibrometry and optical visualisation all considered in detail. Applications of ultrasonic transducers are the focus of part three, beginning with a review of surface acoustic wave devices and air-borne ultrasound transducers, and going on to consider ultrasonic transducers for use at high temperature and in flaw detection systems, power, biomedical and micro-scale ultrasonics, therapeutic ultrasound devices, piezoelectric and fibre optic hydrophones, and ultrasonic motors are also described.

With its distinguished editor and expert team of international contributors,Ultrasonic transducers is an authoritative review of key developments for engineers and materials scientists involved in this area of technology as well as in its applications in sectors as diverse as electronics, wireless communication and medical diagnostics.

- Reviews recent research in the design and application of ultrasonic transducers
- Provides an overview of the materials and design of ultrasonic transducers, with an in-depth exploration of piezoelectricity and basic configurations
- Investigates modelling and characterisation, applications of ultrasonic transducers, and ultrasonic transducers for use at high temperature and in flaw detection systems

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