

Piezoelectric Energy Harvesting Footwear

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Abstract: *As the demand for sustainable and portable energy sources continues to rise, the integration of energy-harvesting technologies into wearable systems offers an innovative solution. Piezoelectric Energy Harvesting Footwear harnesses mechanical energy generated from walking or running and converts it into electrical energy through embedded piezoelectric materials. These materials, strategically placed within the shoe sole, experience mechanical stress with each footstep, producing an electrical charge that can be stored and utilized to power low-consumption electronic devices. This study focuses on the design, material selection, and efficiency analysis of such footwear, considering factors such as energy conversion rate, user comfort, and system durability. Experimental results confirm the potential of this approach for powering wearable electronics and contributing to self-sustaining smart wearable systems.*

Keywords: Piezoelectric effect, energy harvesting, wearable technology, smart footwear, kinetic energy, renewable energy, piezoelectric materials, self-powered devices

