

FLEXIBLE ELECTROSTATIC KINETIC ENERGY HARVESTER

Flexible device able to generate electric power from mechanical deformation

Mechanical (kinetic) energy harvester ■ (Tribo)electret material ■
Triboelectricity ■ Electrostatic transducer

APPLICATIONS

Powering/improving battery lifetime for :

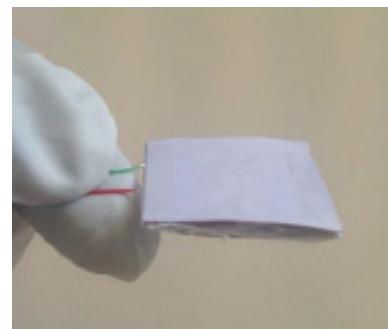
- Embedded chips in smart clothes and shoes
- "Second skin" biomedical sensors
- Smart cards, semi-active RFID systems,
- Strain or pressure sensors (for car wheels for example)

PRESENTATION

Our device converts mechanical energy into electricity, when repeatedly pressed and released by an external mechanical action. The device has a sandwich structure, with flexible or solid electrodes on the surface and with an organic electret material core (see picture). It can be embedded into an object, a cloth or be used as a "second skin".

Electric charges trapped within the device induce an electric current through a charge when a mechanical deformation is applied. The device has no resonance frequency and thus works at any mechanical frequency. Besides, the organic material is designed in such a way so that electric charges remain stable over time, leading to long standing performances.

With a finger tapping activation, the first 3cmx3cm prototype reaches a peak voltage of 27 V and a power of 45.6 μ W. Performances can be further largely enhanced by optimizing triboelectric effect, increasing the size of the device and/or by using it under different conditions (higher mechanical frequencies, more pressure).



Prototype of electrostatic kinetic energy harvester © Philippe Basset

COMPETITIVE ADVANTAGES

- Flexible or solid surface
- Works at any mechanical frequency
- Long standing electric charge storage

INTELLECTUAL PROPERTY

Pending patent

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