

## Nanogenerator for Harvesting Energy (#6668)

*Nanogenerator which generates alternating currents to effectively harness energy*

Inventors at Georgia Tech have developed a compact nanogenerator that uses electrode pairs on cylindrical sliding surfaces to generate an alternating current. The output increases with an increase in velocity. The grating-design Kapton/copper surface ensures a high output efficiency and durability. Unlike most other energy-harvesting technologies, this one targets reciprocating motions driven by either direct or inertia forces, making it suitable for large-amplitude, low-frequency ambient vibration motions in addition to small-amplitude, high-frequency vibrations. The cTENG was demonstrated to harness energy effectively from human body and water wave motions, indicating its potential use in applications such as portable self-powered electronics and power generation.

### Benefits/Advantages

- **Compact** – Easily used for small electronics
- **Energy saving** – Harnesses energy from human body and water wave motions

### Potential Commercial Applications

- Portable and standalone self-powered electronics and power generators
- Remote sensors, marine navigational aids, portable consumer electronics (smartphones, laptops/tablets, MP3 players, etc.), automotive and aerospace electronics, and medical devices/implants

### Background/Context for This Invention

Reciprocating motion is a common form of mechanical motion existing in nature from waves to human body motions. Harnessing such ambient mechanical energy is attracting significant attention for use in portable electronics and sensor networks. However, many of these motions feature long reciprocating distances, low frequencies, and amplitude or frequency fluctuations, which pose challenges for previously developed vibration energy harvesters, more suited for low-amplitude, high-frequency excitations induced by inertia forces.

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## **More Information**

U.S. Patent Issued - [985554](#)

## **Publications**

[\*Case-Encapsulated Triboelectric Nanogenerator for Harvesting Energy from Reciprocating Sliding Motion\*](#), ACNano, 2014

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**For more information about this technology, please visit:**

<https://licensing.research.gatech.edu/technology/nanogenerator-harvesting-energy>

Images:

The automated sequential delivery of multiple fluids. A varying number of delay gates imprinted in the branches are shown in the figure.

COVID-19 and flu saliva test on paper: (A) The automatic sequential delivery of multiple reagents required for virus test; (B) Water pouring into the device triggers the virus assay, allowing the presence of SARS-CoV-2 and influenza A & B viruses to be visually identified by the color changes in the corresponding detection spot

