

NanoTritium battery is good for twenty years (or more)

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(Phys.org) -- Florida-based City Labs says it has created an adult's thumb-sized, battery, NanoTritium, that can last 20 years or more in the most extreme conditions, such as extreme temperature and vibrations.

City Labs requested defense contractor Lockheed Martin to test their batteries, which were confirmed to operate as specified and to be resistant to extreme temperatures (-50°C to $+150^{\circ}\text{C}$), and extreme vibration and altitude. The power cell generates electricity using a layer of the [radioactive](#)-element tritium, mounted onto a semiconductor. The City Labs' battery produces nanowatts of power; it is not strong enough to power a cell phone or laptop. This is a low-power battery that can run micro-electronics, anywhere that is hard, dangerous or expensive to reach.

Applications include implants such as pacemakers as well as devices in industry (sensors on deep-water oil drills) and defense. This is further

described as a commercially-viable “betavoltaic” power source, meaning it’s powered by a radioactive element. Whereas normal batteries are powered by chemical processes, the NanoTritium is powered by physical processes of the benign radioisotope, tritium. The makers point out that tritium is already used in exit signs and divers’ watches.

Peter Cabauy and Denset Serralta founded the company in 2005; Cabauy has a PhD in applied physics. Larry Olsen, who also has a PhD in physics, later joined the business. He is known for his work in the 1970s on betavoltaic batteries. He helped to create a betavoltaic power source strong enough to power pacemakers. Olsen is the City Labs director of research. Others on the staff have similarly strong backgrounds in engineering and science. The company was awarded an Air Force contract of nearly \$1 million for a higher-[power](#), customized battery, and has been fueled by private investors as well.

In a historical review paper about the betavoltaic battery, Olsen, Serralta and Cabauy noted that numerous research groups have continued attempts to commercialize a betavoltaic that is both reliable and safe. Dr. Olsen had published a betavoltaic review suggesting tritium as a safe alternative to other radioisotopes. Independently, City Labs also concluded that [tritium](#) could be an excellent candidate for use within a betavoltaic battery design.

Available commercially, the device is expected to be valued in the “couple thousand dollar range” at first, Cabauy said, but in time as the company produces more the price may become less. The [battery](#) is currently available in “engineering” quantities, according to the company, up to 1,000 a year, and is assembled in the company’s lab.

More information: www.citylabs.net/content/BetavoltaicHistory.pdf

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